

Toshiba Personal Computer
TECRA M9
Maintenance Manual

TOSHIBA CORPORATION

File Number 960-631

[CONFIDENTIAL]

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Toshiba Personal Computer TECRA M9 Maintenance Manual

First edition April 2007

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Preface

This maintenance manual describes how to perform hardware service maintenance for the Toshiba Personal Computer TECRA M9.

The procedures described in this manual are intended to help service technicians isolate faulty Field Replaceable Units (FRUs) and replace them in the field.

SAFETY PRECAUTIONS

Four types of messages are used in this manual to bring important information to your attention. Each of these messages will be italicized and identified as shown below.

DANGER: “Danger” indicates the existence of a hazard that could result in death or serious bodily injury, if the safety instruction is not observed.

WARNING: “Warning” indicates the existence of a hazard that could result in bodily injury, if the safety instruction is not observed.

CAUTION: “Caution” indicates the existence of a hazard that could result in property damage, if the safety instruction is not observed.

NOTE: “Note” contains general information that relates to your safe maintenance service.

Improper repair of the computer may result in safety hazards. Toshiba requires service technicians and authorized dealers or service providers to ensure the following safety precautions are adhered to strictly.

- Be sure to fasten screws securely with the right screwdriver. If a screw is not fully fastened, it could come loose, creating a danger of a short circuit, which could cause overheating, smoke or fire.
- If you replace the battery pack or RTC battery, be sure to use only the same model battery or an equivalent battery recommended by Toshiba. Installation of the wrong battery can cause the battery to explode.

The manual is divided into the following parts:

- Chapter 1 Hardware Overview describes the TECRA M9 system unit and each FRU.
- Chapter 2 Troubleshooting Procedures explains how to diagnose and resolve FRU problems.
- Chapter 3 Test and Diagnostics describes how to perform test and diagnostic operations for maintenance service.
- Chapter 4 Replacement Procedures describes the removal and replacement of the FRUs.
- Appendices The appendices describe the following:
 - Handling the LCD module
 - Board layout
 - Pin assignments
 - Keyboard scan/character codes
 - Key layout
 - Wiring diagrams
 - BIOS rewrite procedures
 - EC/KBC rewrite procedures
 - Reliability

Conventions

This manual uses the following formats to describe, identify, and highlight terms and operating procedures.

Acronyms

On the first appearance and whenever necessary for clarification acronyms are enclosed in parentheses following their definition. For example:

Read Only Memory (ROM)

Keys

Keys are used in the text to describe many operations. The key top symbol as it appears on the keyboard is printed in **boldface** type.

Key operation

Some operations require you to simultaneously use two or more keys. We identify such operations by the key top symbols separated by a plus (+) sign. For example, **Ctrl + Pause (Break)** means you must hold down **Ctrl** and at the same time press **Pause (Break)**. If three keys are used, hold down the first two and at the same time press the third.

User input

Text that you are instructed to type in is shown in the boldface type below:

DISKCOPY A: B:

The display

Text generated by the computer that appears on its display is presented in the type face below:

```
Format complete
System transferred
```

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Chapter 1

Hardware Overview

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1.1 Features

The Toshiba TECRA M9 Personal Computer uses extensive Large Scale Integration (LSI), and Complementary Metal-Oxide Semiconductor (CMOS) technology extensively to provide compact size, minimum weight, low power usage and high reliability. This computer incorporates the following features.

There some models and options. Refer to the Parts List for the configuration of each model and options.

Microprocessor

The TECRA M9 computer is equipped with an Intel® Core™ 2 Duo Processor . These processors incorporate a math co-processor, a 2MB or 4MB L2 cache memory. The PC comes in with one of the following speeds:

Intel® Core™ 2 Duo Processor

- 2.40GHz (T7700) /2.20GHz (T7500) / 2.00GHz (T7300)
In the case of Processor which built in 4MB L2 cache memory
- 1.80GHz (T7100)
In the case of Processor which built in 2MB L2 cache memory

These processors operate at 800MHz bus clock.

Chipset

The TECRA M9 is Equipped with Intel Crestline-GM as North Bridge, Intel ICH8M as South Bridge and PCI7412 as Card Controller.

VGA Controller

An internal Graphics Controller in North Bridge is used.

Memory

The computer comes with two DDR2 SO-DIMM slots. Two memory modules of , 512MB, 1GB (1,024MB) or 2GB (2,048MB) can be installed.

HDD

The computer has a 2.5-inch SATA HDD. The following capacities are available.

- /80/100/120/160 GB

USB FDD

A 3.5-inch USB FDD accommodates 2HD (1.44MB) or 2DD (720KB) disks.

Slim Bay

An Optical drive, 2nd HDD can be installed in the Slim Bay.

Optical Drive

A CD-ROM drive, DVD Super Multi drive can be installed in the Slim Bay.

Display

The PC comes in with one of the following two types:

- 14.1" WXGA-TFT color display, resolution 1,280×800
- 14.1" WXGA+TFT color display, resolution 1,440×900

A video controller and a 128MB VRAM enables an external monitor to display 16M colors at a resolution of 1,280×800 pixels or 1,440×900 pixels.

Keyboard

An-easy-to-use 85(US)/87(UK)-key keyboard provides a numeric keypad overlay for fast numeric data entry or for cursor and page control. The keyboard also includes two keys that have special functions in Microsoft[®] Windows[®] Vista. It supports software that uses a 101- or 102-key enhanced keyboard.

TOSHIBA Dual Pointing Device

The TOSHIBA Dual Pointing Device consists of Touch Pad and AccuPoint. The touch pad and control buttons enable control of the on-screen pointer and scrolling of windows. The pointer control stick and AccuPoint enables convenient control of the cursor.

Batteries

The computer has two batteries: a rechargeable Lithium-Ion main battery pack and RTC battery (that backs up the Real Time Clock and CMOS memory).

Universal Serial Bus (USB2.0)

Three USB ports are provided. The ports comply with the USB2.0 standard, which enables data transfer speeds 40 times faster than USB1.1 standard. USB1.1 is also supported.

 IEEE 1394 port

The computer comes with one IEEE 1394 port. It enables high-speed data transfer directly from external devices such as digital video cameras.

 Serial port

The serial port enables connection of serial devices such as an external modem, serial mouse or serial printer.

 External monitor (RGB) port

The port enables connection of an external monitor, which is recognized automatically by Video Electronics Standards Association (VESA) Display Data Channel (DDC) 2B compatible functions.

 PC card slot

A PC card slot are provided. The PC card slot (PCMCIA) accommodates one Type II card and .

 SD Card slot

The SD Card Slot can accommodate Secure Digital flash memory cards with various capacities. SD cards let you easily transfer data from devices, such as digital cameras and Personal Digital Assistants, which use SD Card flash-memory.

 Fingerprint sensor

The computer is equipped with a fingerprint sensor and fingerprint authentication utility. They enable only person who has registered his/her fingerprint to use the computer.

Docking interface port

The docking interface port enables connection of an optional Express Port Replicator. It provides additional features as follows:

- RJ45 LAN jack
- External monitor port
- DC IN 15V jack
- Security lock slot
- Universal Serial Bus 2.0 port (four)
- DVI port

 Sound system

The sound system is equipped with the following features:

- Stereo speakers
- Built-in microphone
- Digital volume control
- Stereo headphone jack
- External microphone jack
- Supports VoIP

Internal modem

The computer contains a MDC, enabling data and fax communication. It supports ITU-T V.90 (V.92). The transfer rates are 56 Kbps for data reception, 33.6 Kbps for data transmission, and 14,400 bps for fax transmission. However, the actual speed depends on the line quality. The RJ11 modem jack is used to accommodate a telephone line. Both of V.90 and V.92 are supported only in USA, Canada and Australia. Only V.90 is available in other regions.

 Internal LAN

The computer is equipped with LAN circuits that support Gigabit Ethernet LAN (1000 megabits per second, 1000BASE-T). It also supports Wakeup on LAN (WOL), Magic Packet and LED.

 Wireless LAN

The computer is equipped with PCI-Ex MiniCard type wireless LAN board that supports 802.11 a/b/g or 802.11 a/b/g/n in the PCI-Ex MiniCard slot. This function can be switched on and off by a switch on the computer.

 Bluetooth

The computer is equipped with Bluetooth (V2.0+EDR) communications standard enable wireless connection between electronic devices such as computers and printers. It supports wireless communication switch.

 Presentation button

This button switches the display between internal display, external display, simultaneous display and multi-monitor display.

 TOSHIBA Assist button

When this button is pressed during power-on, the PC is connected to "Toshiba Assist".
When this button is pressed during power-off, the PC is turned on and connected to "Toshiba Assist".

The front of the computer is shown in figure 1-1.

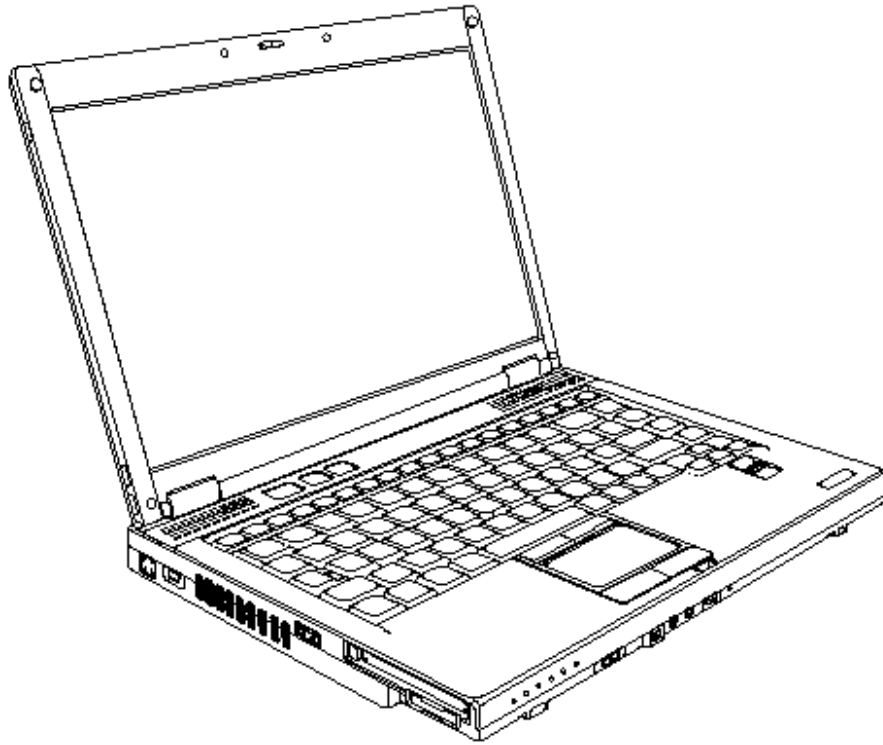


Figure 1-1 Front of the computer

The system unit configuration is shown in figure 1-2.

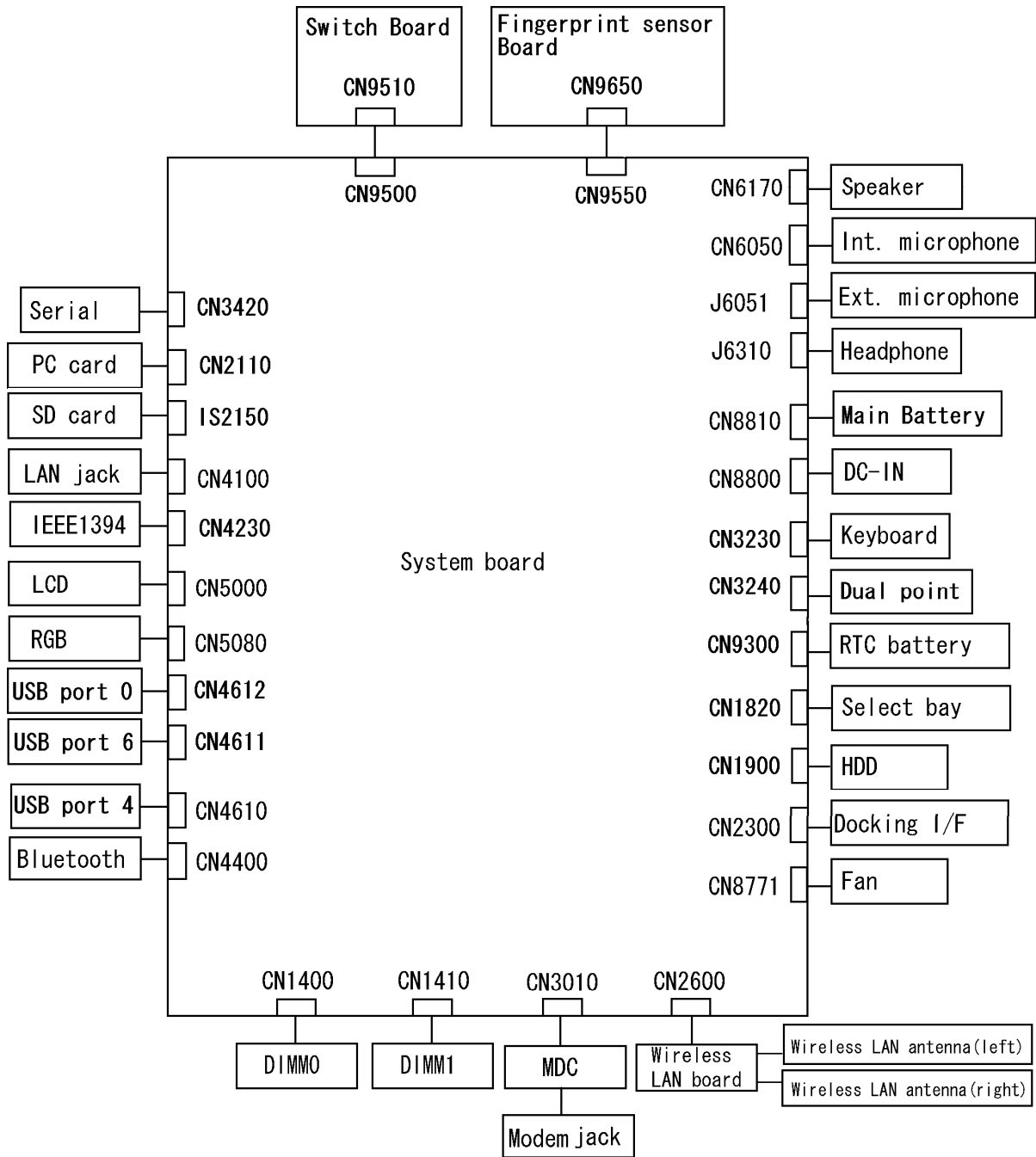


Figure 1-2 System unit configuration

1.2 System Unit Block Diagram

Figure 1-3 is a block diagram of the system unit.

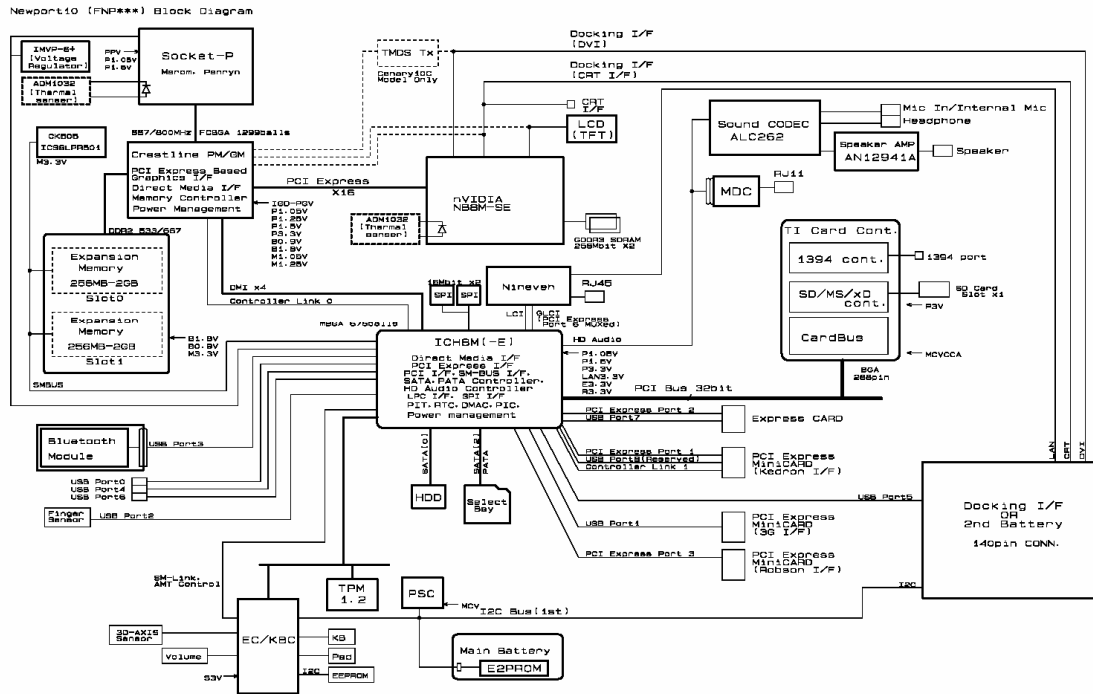


Figure 1-3 System unit block diagram

The system unit is composed of the following major components:

❑ Processor

- Intel® Core™ 2 Duo Processor
- Core speed:
 - 2.40GHz (T7700) / 2.20GHz (T7500) / 2.00GHz (T7300)
In the case of Processor which built in 4MB L2 cache memory
 - 1.80GHz (T7100)
In the case of Processor which built in 2MB L2 cache memory
- (): Processor Number
- Processor bus speed: 800MHz
- Core voltage: 0.50V to 1.325V
- Integrated L2 cache memory of 2MB or 4MB
- Integrated NDP
- 478-pin Micro FC-PGA package

❑ Memory

Two memory slots are provided. Expansion up to 4GB (4,096MB) is available.

Memory

- DDR2-SDRAM
- 667MHz
- 1.8 volt operation
- FBGA

Memory Module

- 200 pin, SO Dual In-line Memory Module (SO-DIMM)
- PC 5300
- 512MB/1GB (1,024MB)/2GB (2,048MB)

❑ Intel Crestline-GM (North Bridge)

- Features:
 - Meorom Processor System Bus Supports
 - PCI Express Based Graphics Interface
 - System Memory supports :DDR2-533 / DDR2-667, 4GB max.
 - DMI(Direct Media Interface)
 - Power management control (ACPI2.0 conformity)

❑ Intel ICH8M (South Bridge)

- Features:
 - DMI(Direct Media Interface)
 - PCI Express Interface
 - PCI Bus I/F Rev2.3 (4 PCI REQ/GNT Pairs)
 - Integrated Serial ATA Host Controller
 - Integrated IDE Controller (Ultra ATA 100/66/33)
 - Intel High Definition controller (Azalia)
 - USB 1.1/2.0 Controller
 - Power Management (ACPI 2.0 compliance)
 - SMBus2.0 controller
 - SPI Interface(BIOS)
 - LPC interface (EC/KBC, Super I/O)
 - IRQ controller
 - Serial Interrupt Function
 - Suspend/Resume control
 - Built –in RTC
 - GPIO

❑ Cardbus controller (TI PCI8412ZHK)

- PCI Interface(PCI Rev.2.2)
- SD IO Controller(Ver.1.1)
- CardBus / Ultra media Controller (Yenta Ver.2.2:1 socket)
- SD/MMC(SDHC Ver. 1.2 revised edition) , Memory Stick, Memory Stick pro, XD Card Controller
- 1394 Controller
- 16 x16x1.4mm BGA Package
-

❑ VGA

Graphics interface in North Bridge (Intel Crestline-GM) is used.

❑ Sound Controller

- Azalia
- Amplifier: Mathushita made AN12941A
- Stereo speakers
- Digital volume control
- Supports VoIP
- Stereo headphone jack
- External microphone jack
- Built-in microphone

❑ EC/KBC (Embedded Controller/Keyboard Controller)

- One Mitsubishi M306KAFCLPR micon chip functions as both EC and KBC.

❑ PSC (Power Supply Controller)

- One TMP86FS49AUG chip is used.
- This controller controls the power sources.

❑ Clock Generator

- IDT 9LPR501PGLFT is used.
- This device generates the system clock.

❑ Modem Controller

- One MDC is used.
- This controller has the following functions:
 - One RJ11 port
 - Azalia MDC1.5
 - V.92 (V.90) 56K Modem/FAX
 - Ring wake up support

❑ Internal LAN Controller

- Intel made only GigaBit Ether is used.
- This controller has the following functions:
 - PCI-Ex connection
 - Supports Gigabit Ethernet
 - One RJ45 port
 - WOL support
 - Magic Packet support
 - LED support

Wireless LAN

- One PCI-Ex MiniCard
- Intel Kedron a/b/g or a/b/g/n
- Supports Wireless Communication SW
- Supports W-LAN via PCMCIA (Euro : GSM/GPRS)

 Super I/O

- SMSC LPC47N217-JV chip is used.
- This gate array has the following features:
 - Serial Port Controller
 - GPIO Controller

 Bluetooth

- V2.0+EDR
- USB interface connection

 Sensor

- Thermal Sensor: One ADM1032ARMZ chip is used.
- LCD Sensor: One NRS-701-1015T chip is used.
- Acceleration Sensor

1.3 3.5-inch Floppy Disk Drive (USB External)

The 3.5-inch FDD is a thin, high-performance reliable drive that supports 720KB (formatted) 2DD and 1.44MB (formatted) 2HD disks.

The FDD is shown in figure 1-4. The specifications for the FDD are listed in Table 1-1.

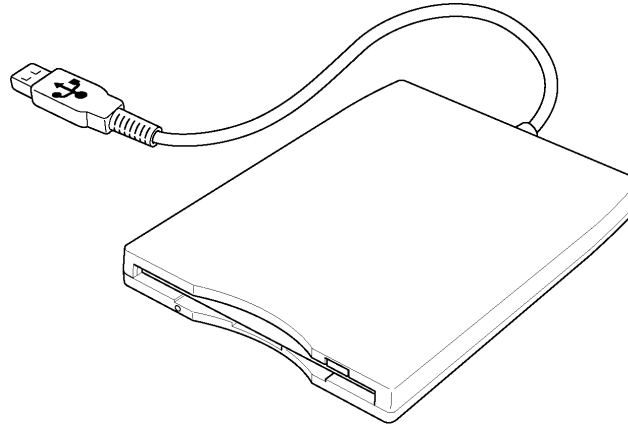


Figure 1-4 3.5-inch FDD (USB External)

Table 1-1 3.5-inch FDD specifications

| Items | | TEAC FD-05PUB-337 (G8AC0000B320) | |
|---------------------|----------|-------------------------------------|------------------|
| | | 720KB mode | 1.44MB mode |
| Data transfer rate | FDD part | 250K bits/second | 500K bits/second |
| | USB | Full speed mode (12M bits/second) | |
| Disk rotation speed | | 300rpm | |
| Track density | | 5.3 track/mm (135TPI) | |

1.4 2.5-inch Hard Disk Drive

The removable HDD is a random access non-volatile storage device. It has a non-removable 2.5-inch magnetic disk and mini-Winchester type magnetic heads.

The computer supports a 80GB, 120GB or 160GB.

The HDD is shown in figure 1-5. Specifications are listed in Table 1-2.

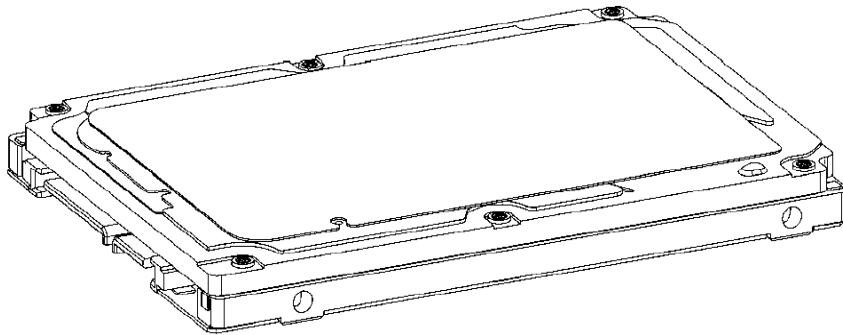


Figure 1-5 2.5-inch HDD

Table 1-2 2.5-inch HDD specifications

| Items | | Specifications | | |
|--------------------------------------|-------------|-------------------------|-------------------------|-------------------------|
| | | FUJITSU G8BC0003J080 | FUJITSU G8BC0003H120 | FUJITSU G8BC0003J160 |
| Outline Dimensions | Width (mm) | 100.0 | | |
| | Height (mm) | 9.5 | | |
| | Depth (mm) | 70.0 | | |
| | Weight (g) | 101 max | | |
| Storage size (formatted) | | 80GB | 120GB | 160GB |
| Speed (RPM) | | 5,400 | | |
| Data transfer speed (Mb/s) | | 72.4 MB/s Max | | |
| To/Form Media | | 150 MB/s (Genli) | | |
| To/Form Host | | | | |
| Data buffer size (MB/s) | | 8 | | |
| Positioning Time(read and seek time) | | Read: 12ms | | |
| Motor startup time (s) | | 4 | | |

1.5 DVD-Super Multi Drive

This drive is a combination of DVD-ROM and DVD±R/±RW/-RAM Drive. It is full-size and runs either 12cm (4.72-inch) or 8cm (3.15-inch) DVD/CDs without an adaptor. It reads DVDs at maximum 8-speed and CDs at maximum 24-speed. It also writes CD-R at maximum 24-speed, CD-RW at maximum 16-speed, DVD-R at maximum 8-speed, DVD-RW at maximum 6-speed, DVD+R at maximum 8-speed, DVD +RW at maximum 8-speed and DVD-RAM at maximum 5 speed.

The DVD Super Multi drive is Specifications are listed in Table 1-3.

Table 1-3 DVD Super Multi drive specifications

| Item | Panasonic UJ-852 (G8CC00034120) |
|------------------------|---|
| IDE Data Transfer Mode | 33.3 (Ultra DMA mode 2) 16.6 (PIO Mode 4, Multi word DMA mode 2) |
| Data buffer (MB) | 2 |
| Supported format | CDs DVD-ROM CD-R (Read/ Write) Multi-Speed CD-RW discs (Read/ Write) High-Speed CD-RW discs (Read/ Write) Ultra-Speed CD-RW discs (Read/ Write) DVD-R Ver.2.00 for General(Read/ Write) DVD-R DL (Read/Write) DVD+R (Read/Write) DVD+R DL (Read / Write) DVD-RW Ver.1.0 &1.1 &1.2(Read/ Write) DVD+RW (Read/Write) DVD-RAM Ver.2.0 &2.1 &2.2(Read/ Write) |

1.6 Keyboard

The keyboard is mounted 85(US)/87(UK) keys that consist of character key and control key, and in conformity with JIS. The keyboard is connected to membrane connector on the system board and controlled by the keyboard controller.

Figure 1-6 is a view of the keyboard.

See Appendix E about a layout of the keyboard.



Figure 1-6 Keyboard

1.7 TFT Color Display

The TFT color display consists of 14.1-inch WXGA/WXGA+ LCD module and FL inverter board.

1.7.1 LCD Module

The LCD module used for the TFT color display uses a backlight as the light source and can display a maximum of 16M colors with 1,280 x 800 or 1,440 x 900 resolution. The Intel Crestline-GM can control internal and external WXGA or WXGA+ support displays simultaneously.

Figure 1-7 shows a view of the LCD module and Table 1-4 lists the specifications.

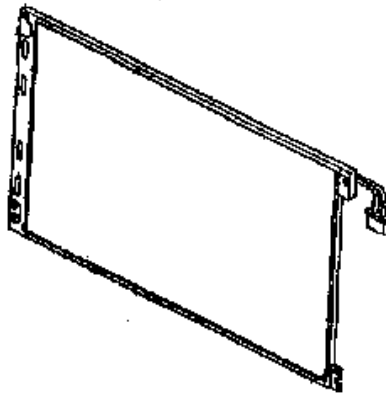


Figure 1-7 LCD module

Table 1-4 LCD module specifications (1/3)

| Item | Specifications |
|--------------------|-----------------------------------|
| | 14.1-inch WXGA TFT (G33C0003X110) |
| Number of Dots | 1,280 (W) x 800 (H) |
| Dot spacing (mm) | 0.2370 (H) x 0.2370 (V) |
| Display range (mm) | 303.36 (H) x 189.6 (V) |

Table 1-4 LCD module specifications (2/3)

| Item | Specifications |
|--------------------|-----------------------------------|
| | 14.1-inch WXGA TFT (G33C00041110) |
| Number of Dots | 1,280 (W) x 800 (H) |
| Dot spacing (mm) | 0.2373 (H) x 0.2373 (V) |
| Display range (mm) | 303.74 (H) x 189.84 (V) |

Table 1-4 LCD module specifications (3/3)

| Item | Specifications |
|--------------------|---|
| | 14.1-inch WXGA+ TFT (G33C00043110) |
| Number of Dots | 1,440 (W) x 900 (H) |
| Dot spacing (mm) | 0.2109 (H) x 0.2109 (V) |
| Display range (mm) | 303.76 (H) x 193 (V) |

1.7.2 FL Inverter Board

The FL inverter board supplies a high frequency current to illuminate the LCD module.

Table 1-5 lists the FL inverter board specifications.

Table 1-5 FL inverter board specifications

| Item | | Specifications |
|--------|--------------|---------------------|
| | | G71C0006A110 |
| Input | Voltage (V) | DC 5 |
| | Power (W) | 7 |
| Output | Voltage (V) | 750 |
| | Current (mA) | 5.90 |
| | Power (mA) | 5W/7VA |

1.8 Power Supply

The power supply supplies many different voltages to the system board and performs the following functions:

1. Judges that the DC power supply (AC adapter) is connected to the computer.
2. Detects DC output and circuit malfunctions.
3. Controls the battery icon, and DC IN icon.
4. Turns the battery charging system on and off and detects a fully charged battery.
5. Turns the power supply on and off.
6. Provides more accurate detection of a low battery.
7. Calculates the remaining battery capacity.
8. Controls the transmission of the status signal of the main battery.

The power supply output rating is specified in Table 1-6.

Table 1-6 Power supply output rating (1/4)

| Use | Voltage (V) | Name |
|-----------|-------------|-----------|
| Clock Gen | 3.3 | CK-EYV |
| | | M-E3V |
| | | P3V |
| CPU | 1.05 | 1R05-P1V |
| | 1.5 | 1R05-P1V |
| | 0.55-1.325 | PPV |
| (G)MCH | 1.05 | 1R05M-E1V |
| | 1.05 | 1R05-P1V |
| | 1.25 | 1R25M-E1V |
| | 1.25 | 1R25-P1V |
| | 1.5 | 1R5-P1V |
| | 1.8 | 1R8-B1V |
| | 1.05 | IGD-PGV |
| | 3.3 | P3V |
| Memory | 0.9 | 0R9-B0V |
| | 1.8 | 1R8-B1V |
| ICH8M(-E) | 1.05 | 1R05-P1V |
| | 1.25 | 1R25-P1V |
| | 1.5 | 1R5-P1V |
| | 3.3 | E3V |
| | 3.3 | LAN-E3V |
| | 3.3 | P3V |
| | 2-3.5 | R3V |

Table 1-6 Power supply output rating (2/4)

| Use | Voltage (V) | Name |
|-----------------|-------------|------------|
| ODD | 3.3 | P3V |
| | 5 | P5V |
| | 3.3 | SB-P3V |
| | 5 | SB-P5V |
| HDD | 3.3 | P3V |
| | 5 | P5V |
| Card Cont. | 3.3 | P3V |
| PC Card | 3.3 | MCVCCA-PYV |
| | 5 | MCVPPA-PYV |
| PC Card PS | 5 | P5V |
| | 3.3 | P3V |
| SD Card | 3.3 | FM-P3V |
| SD Card PS | 3.3 | P3V |
| Express Card | 1.5 | CRD1R5-P1V |
| | 3.3 | CRD-E3V |
| | 3.3 | CRD-P3V |
| Express Card PS | 1.5 | 1R5-P1V |
| | 3.3 | E3V |
| | 3.3 | P3V |
| W-LAN | 1.5 | 1R5-P1V |
| | 3.3 | E3V |
| | 3.3 | P3V |

Table 1-6 Power supply output rating (3/4)

| Use | Voltage (V) | Name |
|-----------------|-------------|------------|
| SIM Card | 3.3 | UIMPWR-E3V |
| Robson | 1.5 | 1R5-P1V |
| | 3.3 | P3V |
| SPI | 3.3 | LAN-E3V |
| MDC | 3.3 | E3V |
| EC/KBC | 3.3 | S3V |
| Touch Pad | 5 | SP-P5V |
| LED | 5 | M5V |
| TPM | 3.3 | E3V |
| | 3.3 | P3V |
| Accelerometer | 3.3 | S3V |
| Finger Sens. | 3.3 | FS-E3V |
| | 5 | FS-E5V |
| Finger Sens PS. | 3.3 | E3V |
| Super I/O | 3.3 | P3V |
| RS232C Driver | 3.3 | P3V |
| LAN | 1.05 | LN1R0- E1V |
| | 1.8 | LN1R8- E1V |
| | 3.3 | LNP -E3V |
| LAN PS | 3.3 | E3V |
| Bluetooth | 3.3 | BT-P3V |
| Bluetooth PS | 5 | P5V |
| USB | 5 | USB0PS-E5V |
| | 5 | USB1PS-E5V |
| USB PS | 5 | E5V |

Table 1-6 Power supply output rating (4/4)

| Use | Voltage (V) | Name |
|-----------------|-------------|----------|
| GPU | 1.2 | 1R2-P1V |
| | 1.8 | 1R8-P1V |
| | 3.3 | P3V |
| | 1.0-1.1 | PGV |
| VRAM | 1.8 | 1R8-P1V |
| LCD | 5 | FL-P5V |
| | 3.3 | PNL-P3V |
| LCD PS | 5 | P5V |
| | 3.3 | P3V |
| DVI Transmitter | 2.5 | 2R5-P2V |
| AMP | 4.7 | A4R7-P4V |
| | 5 | SND-P5V |
| CODEC | 4.7 | A4R7-P4V |
| | 3.3 | P3V |
| Headphone AMP | 3.3 | P3V |
| PSC | 5 | MCV |
| FAN | 5 | E5V |
| | 5 | P5V |

1.9 Batteries

The computer has three types of batteries as follows:

- Main battery pack
- RTC battery

The battery specifications are listed in Table 1-7.

Table 1-7 Battery specifications

| Battery name | | | Material | Output voltage | Capacity |
|--------------|---------------------------|-------------------|-------------|----------------|-----------|
| Main battery | battery | G71C00083110/210 | Lithium-Ion | 10.8 V | 4,000 mAh |
| | battery | G71C00084110/210 | Lithium-Ion | 10.8 V | 5,100 mAh |
| | Extended capacity battery | G71C0006B110/B210 | Lithium-Ion | 10.8 V | 7,050 mAh |
| | High capacity battery | G71C0003W910/A10 | Lithium-Ion | 10.8 V | 8,800 mAh |
| RTC battery | | GDM710000041 | NiMH | 2.4 V | 16 mAh |

1.9.1 Main Battery

The removable main battery pack is the computer's main power source when the AC adaptor is not attached. The main battery maintains the state of the computer when the computer enters in sleep mode.

1.9.2 Battery Charging Control

Battery charging is controlled by a power supply microprocessor. The microprocessor controls whether the charge is on or off and detects a full charge when the AC adaptor and battery are attached to the computer. The system charges the battery.

Battery Charge

When the AC adaptor is attached, there are two types of charge: When the system is powered off and when the system is powered on. Table 1-8 lists the charging time required for charges.

Table 1-8 Time required for charges

| Battery type | Power on (hours) | Power off (hours) |
|---|-------------------|-------------------|
| Battery(4,000 mAh) | About 4.5 to 9.5 | About 2.5 |
| Battery(5,100 mAh) | About 5.5 to 12.0 | About 3.0 |
| Extended capacity Battery(7,050 mAh) | About 8.0 to 19.5 | About 3.5 |
| High capacity battery(8,800 mAh) | About 9.0 to 21.0 | About 4.0 |

NOTE: *The time required when the system is powered on is affected by the amount of power the system is consuming. Use of the fluorescent lamp and frequent disk access diverts power and lengthens the charge time.*

If any of the following occurs, the battery charge process stops.

1. The battery becomes fully charged.
2. The AC adaptor or battery is removed.
3. The battery or output voltage is abnormal.

Detection of full charge

A full charge is detected only when the battery is charging at charge. A full charge is detected under any of the following conditions:

1. The current in the battery charging circuit drops under the predetermined limit.
2. The charging time exceeds the fixed limit.

1.9.3 RTC battery

The RTC battery provides power to keep the current date, time and other setup information in memory while the computer is turned off. Table 1-9 lists the charging time and data preservation period of the RTC battery.

Table 1-9 RTC battery charging/data preservation time

| Status | Time |
|--|-------------|
| Charging Time (power on) | 24 hours |
| Data preservation period (full charge) | 30 days |

1.10 AC Adapter

The AC adapter is also used to charge the battery.

Table 1-10 lists the AC adapter specifications.

Table 1-10 AC adapter specifications

| Parameter | Specification | |
|------------------|--|----------------------|
| | G71C0006Q210 (2-pin) | G71C0006R210 (3-pin) |
| Power | 75W (Peak 90W) | |
| Input voltage | 100V/240V | |
| Input frequency | 50Hz to 60Hz | |
| Input current | 1.5A or less (100V-240V) | |
| B Output voltage | 15V | |
| Output current | 0A to 5A (At constant voltage mode) 5A to 6A (At surge load mode) | |

Chapter 2

Troubleshooting Procedures

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2.1 Troubleshooting

Chapter 2 describes how to determine if a Field Replaceable Unit (FRU) in the computer is causing the computer to malfunction. The FRUs covered are:

- | | | |
|--------------------------|------------------|------------------------|
| 1. Power Supply | 6. Display | 11. Wireless LAN |
| 2. System Board | 7. Optical Drive | 12. Sound components |
| 3. USB Floppy Disk Drive | 8. Modem | 13. SD Card Slot |
| 4. Hard Disk Drive | 9. LAN | 14. Fingerprint sensor |
| 5. Keyboard/Dual point | 10. Bluetooth | . |

The Diagnostics Disk operations are described in Chapter 3. Detailed Replacement Procedures are given in Chapter 4, *Replacement Procedures*.

The following tools are necessary for implementing the troubleshooting procedures:

The following tools are necessary for implementing the Diagnostics procedures:

For tools required for executing the Test Program, refer to the Chapter 3. For tools required for disassembling/assembling, refer to the Chapter 4.

1. A set of tools for debugging port test (test cable, test board, RS-232C cross cable, display, D port FD)
2. A PC with a serial port (for displaying debug port test result)
3. DOS system FD
4. An external CRT display(for Display trouble shooting)
5. A SD card(for SD card slot trouble shooting)
6. An external microphone(for Sound trouble shooting)
7. Headphone(for Sound trouble shooting)

2.2 Troubleshooting Flowchart

Use the flowchart in Figure 2-1 as a guide for determining which FRU malfunctions. Before going through the flowchart steps, check the following:

- Ask the user if a password is registered and, if it is, ask him or her to enter the password.
- Make sure that Toshiba Windows is installed on the hard disk. Non-Toshiba operating systems can cause the computer malfunction.
- Make sure all optional equipment is removed from the computer.
- Make sure the USB FDD and optical drive are empty.

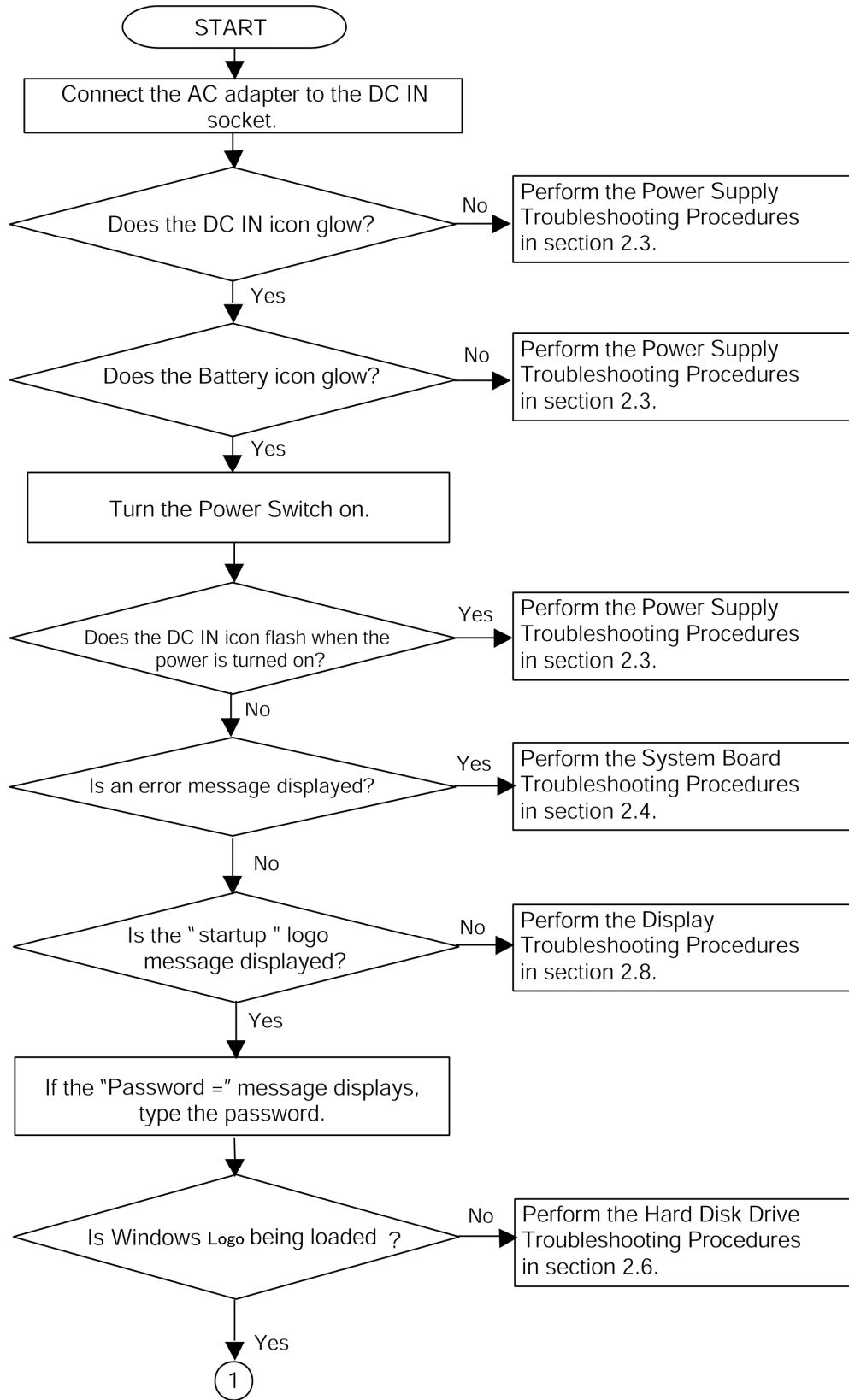


Figure 2-1 Troubleshooting flowchart (1/2)

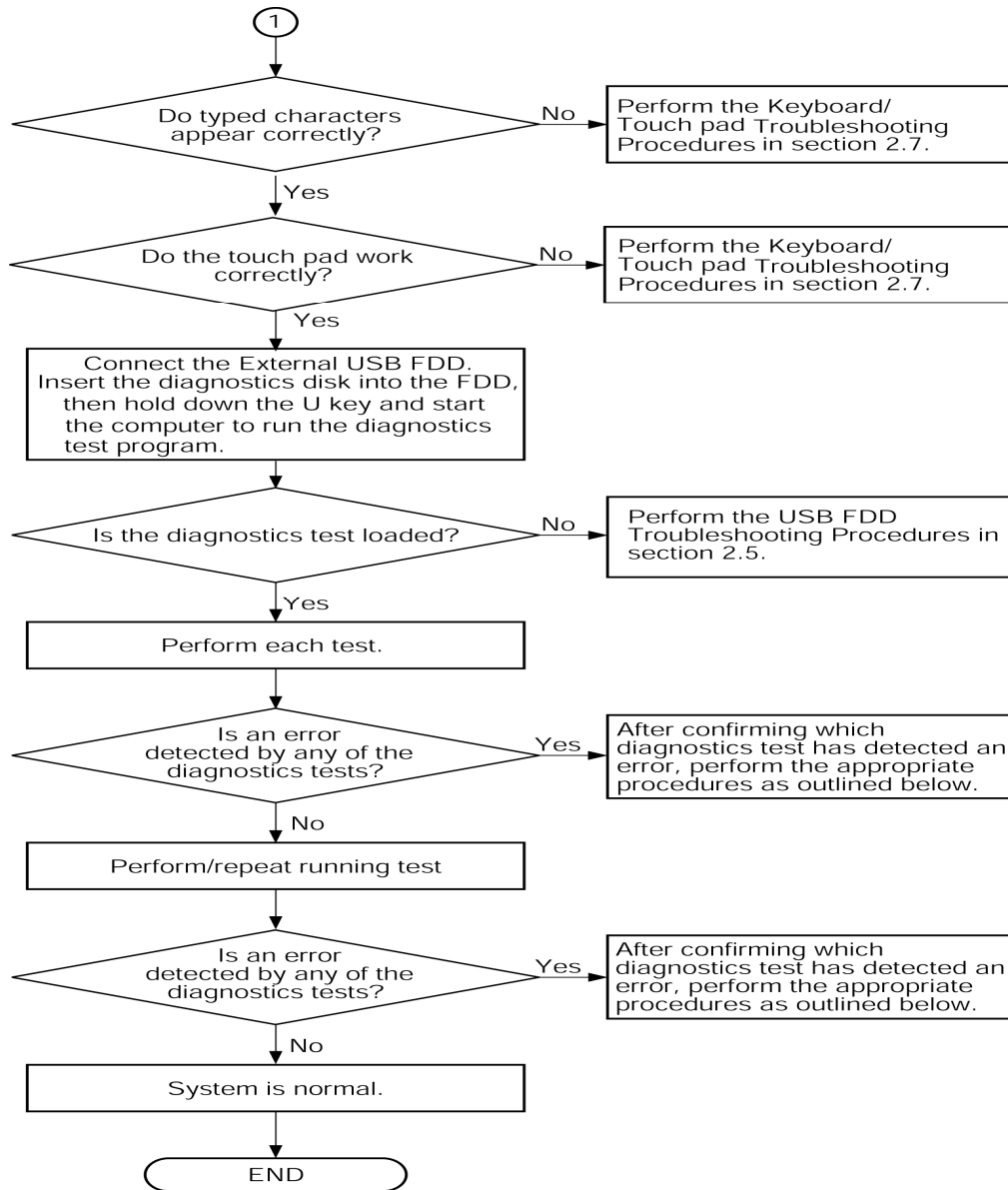


Figure 2-1 Troubleshooting flowchart (2/2)

If the diagnostics program cannot detect an error, the problem may be intermittent. The Running Test program should be executed several times to isolate the problem. Check the Log Utilities function to confirm which diagnostic test detected an error, then perform the appropriate troubleshooting procedures as follows:

1. If an error is detected on the system test, memory test, real timer test, perform the System Board Troubleshooting Procedures in Section 2.4.
2. If an error is detected on the floppy disk test, perform the USB FDD Troubleshooting Procedures in Section 2.5.
3. If an error is detected on the hard disk test, perform the HDD Troubleshooting Procedures in Section 2.6.
4. If an error is detected on the keyboard test, perform the Keyboard and Dual point Troubleshooting Procedures in Section 2.7.
5. If an error is detected on the display test, perform the Display Troubleshooting Procedures in Section 2.8.
6. If an error is detected on the CD-ROM/DVD-ROM test, perform the Optical Drive Troubleshooting Procedures in Section 2.9.
7. If an error is detected on the modem test, perform the Modem Troubleshooting Procedures in Section 2.10.
8. If an error is detected on the LAN test, perform the LAN Troubleshooting Procedures in Section 2.11.
9. If an error is detected on the Bluetooth test, perform the Bluetooth Troubleshooting Procedures in Section 2.12.
10. If an error is detected on the Wireless LAN test, perform the Wireless LAN Troubleshooting Procedures in Section 2.13.
11. If an error is detected on the sound test, perform the Sound Troubleshooting Procedures in Section 2.14.
12. If an error is detected on SD card, perform the SD Card Slot Troubleshooting Procedures in Section 2.15.
13. If an error is detected on Fingerprint sensor, perform the Fingerprint sensor Troubleshooting Procedures in Section 2.16.

2.3 Power Supply Troubleshooting

The power supply controls many functions and components. To determine if the power supply is functioning properly, start with Procedure 1 and continue with the other Procedures as instructed. The procedures described in this section are:

- Procedure 1: Icons in the LCD Check
- Procedure 2: Error Code Check
- Procedure 3: Connection Check
- Procedure 4: Charge Check
- Procedure 5: Replacement Check

Procedure 1 Icons in the LCD Check

The following Icons in the LCD indicate the power supply status:

- Battery icon
- DC IN icon

The power supply controller displays the power supply status through the Battery icon and the DC IN icon in the LCD as listed in the tables below. To check the power supply status, install a battery pack and connect an AC adaptor.

Table 2-1 Battery icon

| Battery icon | Power supply status |
|----------------|--|
| Lights orange | Battery has been charging and AC adaptor is connected. |
| Lights green | Battery is fully charged and AC adaptor is connected. |
| Flashes orange | Battery charge is low. The AC adaptor must be connected to recharge the battery. |
| Doesn't light | Any condition other than those above. |

Table 2-2 DC IN icon

| DC IN icon | Power supply status |
|----------------|---|
| Lights green | DC power is being supplied from the AC adaptor. |
| Flashes orange | There is a problem with the power supply. |
| Doesn't light | Any condition other than those above. |

Procedure 2 Error Code Check

If the power supply microprocessor detects a malfunction, it indicates the error code as shown below.

The error code begins with the least significant digit.

Table 2-3 Error code

| Error code | Where Error occurs |
|-------------------|---------------------------|
| 1*h | AC Adaptor |
| 2*h | 1st battery |
| 3*h | 2nd Battery |
| 4*h | S3V output (P60) |
| 5*h | 1R5-C1V output (P61) |
| 6*h | 1R5-C1V output (P62) |
| 7*h | PPV output (P63:CH0) |
| 8*h | PTV output (P64) |
| 9*h | E5V output (P65) |
| A*h | E3V output (P66) |
| B*h | PPV output (P63:CH1) |
| C*h | 1R35-P1V output (P64) |
| D*h | 1R25-P1V output (P65) |
| E*h | 2R5-B2V output (P66) |

Check 1 Compare the patterns in the hexadecimal error code to the tables below.

AC Adaptor

| Error code | Meaning |
|------------|--|
| 10h | AC Adaptor output voltage is over 16.5V. |
| 11h | Express Port Replicator voltage is over 16.5V. |
| 12h | Current from the DC power supply is over 7.00A. |
| 13h | Current from the DC power supply is over 0.5A when there is no load. |
| 14h | Correction value of 0[A] is out of designed value. |

1st Battery

| Error code | Meaning |
|------------|--|
| 21h | 1st battery discharge current over 7.00A.. |
| 22h | 1st battery discharge current over 3.9A when there is no load. |
| 23h | 1st battery charge current is over 3.9A in charging. |
| 24h | Correction value of 0[A] is out of designed value. |
| 25h | 1st battery charge current is over 0.3A in not charging. |

3V output (P60)

| Error code | Meaning |
|------------|---|
| 40h | S3V voltage is 2.81V or less when the computer is powered on/off. |
| 45h | S3V voltage is 2.81V or less in normal conditions. |

1R5-C1V output (P61)

| Error code | Meaning |
|------------|--|
| 50h | 1R5-C1V voltage is over 1.80V when the computer is powered on/off. |
| 51h | 1R5-C1V voltage is 1.275V or less when the computer is powered on. |
| 52h | 1R5-C1V voltage is 1.275V or less when the computer is booting up |
| 53h | 1R5-C1V voltage is 4.50V or less when the computer is suspended. |
| 54h | 1R5-C1V voltage is not Normal when the CV support is in Shutdown(s) state. |
| 55h | 1R5-C1V voltage is 1.275V or less when the CV support is booting up |

❑ 1R5-C1V output (P62)

| Error code | Meaning |
|------------|--|
| 60h | 1R5-C1V voltage is over 2.15V when the computer is powered on/off. |
| 61h | 1R5-C1V voltage is 1.275V or less when the computer is powered on. |
| 62h | 1R5-C1V voltage is 1.275V or less when the computer is booting up |
| 63h | 1R5-C1V voltage is 1.275V or less when the computer is suspended. |
| 64h | 1R5-C1V voltage is not Normal when the CV support is in Shutdown(s) state. |
| 65h | 1R5-C1V voltage is 1.275V or less when the CV support is booting up |

❑ PPV output (P63:MUX- CH0)

| Error code | Meaning |
|------------|--|
| 70h | PPV voltage is over 1.80V when the computer is powered on/off. |
| 71h | PPV voltage is 0.56V or less when the computer is powered on. |
| 72h | PPV voltage is 0.56V or less when the computer is booting up |
| 73h | PPV voltage is 0.56V or more when the computer is powered off. |

❑ PGV output (P64:MUX- CH0)

| Error code | Meaning |
|------------|--|
| 80h | PGV voltage is over 6.00V when the computer is powered on/off. |
| 81h | PGV voltage is 4.50V or less when the computer is powered on. |
| 82h | PGV voltage is 4.50V or less when the computer is booting up |
| 83h | PGV voltage is 4.50 or more when the computer is powered off. |
| 84h | PGV voltage is 4.50V or less when the computer is suspended. |

❑ PTV output (P65:MUX- CH0)

| Error code | Meaning |
|------------|--|
| 90h | PTV voltage is over 1.26V when the computer is powered on/off. |
| 91h | PTV voltage is 0.89V or less when the computer is powered on. |
| 92h | PTV voltage is 0.89V or less when the computer is booting up |
| 93h | PTV voltage is 0.89 or more when the computer is powered off. |
| 94h | PTV voltage is 0.89V or less when the computer is suspended. |

❑ 1R9-B1V output (P66:MUX- CH0)

| Error code | Meaning |
|------------|--|
| A0h | 1R9-B1V voltage is over 2.40V when the computer is powered on/off. |
| A1h | 1R9-B1V voltage is 1.53V or less when the computer is powered on. |
| A2h | 1R9-B1V voltage is 1.53V or less when the computer is booting up |
| A3h | 1R9-B1V voltage is 1.53 or more when the computer is powered off. |
| A4h | 1R9-B1V voltage is 1.53V or less when the computer is suspended. |

❑ PGV output (P63:MUX- CH1)

| Error code | Meaning |
|------------|--|
| B0h | PGV voltage is over1.62V when the computer is powered on/off. |
| B1h | PGV voltage is 0.68V or less when the computer is powered on. |
| B2h | PGV voltage is 0.68V or less when the computer is booting up |
| B3h | PGV voltage is 0.68V or more when the computer is powered off. |

❑ E3V output (P64:MUX- CH1)

| Error code | Meaning |
|------------|--|
| B0h | E3V voltage is over 3.96V when the computer is powered on/off. |
| B1h | E3V voltage is 2.81V or less when the computer is powered on. |
| B2h | E3V voltage is 2.81V or less when the computer is booting up |
| B3h | E3V voltage is 2.81V or more when the computer is powered off. |
| B4h | E3V voltage is 2.81V or less when the computer is suspended. |

❑ PTV output (P65:MUX- CH1)

| Error code | Meaning |
|------------|--|
| D0h | PTV voltage is over 1.26V when the computer is powered on/off. |
| D1h | PTV voltage is 0.89V or less when the computer is powered on. |
| D2h | PTV voltage is 0.89V or less when the computer is booting up |
| D3h | PTV voltage is 0.89V or more when the computer is powered off. |
| D4h | PTV voltage is 0.89V or less when the computer is suspended. |

□ 1R9-B1V output (P66:MUX- CH1)

| Error code | Meaning |
|-------------------|--|
| E0h | 1R9-B1V voltage is over 2.40V when the computer is powered on/off. |
| E1h | 1R9-B1V voltage is 1.53V or less when the computer is powered on. |
| E2h | 1R9-B1V voltage is 1.53V or less when the computer is booting up |
| E3h | 1R9-B1V voltage is 1.53 or more when the computer is powered off. |
| E4h | 1R9-B1V voltage is 1.53V or less when the computer is suspended. |

Check 2 In the case of error code 10h or 12h:

- Make sure the AC adaptor cord and AC power cord are firmly plugged into the DC IN 15 V socket and wall outlet. If the cables are connected correctly, go to the following step:
- Connect a new AC adaptor and/or AC power cord, if necessary. If the error still exists, go to Procedure 5.

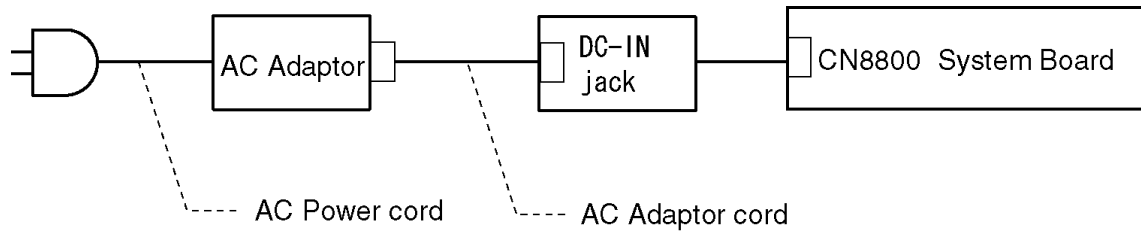
Check 3 In the case of error code 2Xh:

- Make sure the battery pack is correctly installed in the computer. If the battery pack is correctly installed, go to the following step:
- Replace the battery pack with a new one. If the error still exists, go to Procedure 5.

Check 4 For any other error, go to Procedure 5.

Procedure 3 Connection Check

The power supply wiring diagram is shown below:



Any of the connectors may be disconnected. Perform Check 1.

- Check 1 Disconnect the AC power cord from the wall outlet. Check the power cable for breaks. If the power cord is damaged, connect a new AC power cord. If there is no damage, go to Check 2.
- Check 2 Make sure the AC adaptor cord and AC power cord are firmly plugged into the DC-IN jack socket and AC adaptor inlet/wall outlet, respectively. If these cables are connected correctly, go to Check 3.
- Check 3 Make sure the DC IN jack is firmly connected to the connector CN8800 on the system board.
- If the DC IN jack is not firmly connected, go to Procedure 5.
 - If it is connected, go to Check 4.
- Check 4 Use a multimeter to make sure the AC adaptor output voltage is close to 15 V. If the output is several percent lower than 15 V, go to Check 5. If the output is close to 15 V, go to Check 6.
- Check 5 Connect a new AC adaptor or AC power cord.
- If the DC IN icon does not light, go to Procedure 5.
 - If the battery icon does not light, go to Check 6.
- Check 6 Make sure the battery pack is installed in the computer correctly. If the battery is properly installed and the battery icon still does not light, go to Procedure 4.

Procedure 4 Charge Check

The power supply may not charge the battery pack. Perform the following procedures:

1. Reinstall the battery pack.
2. Attach the AC adaptor and turn on the power. If you cannot turn on the power, go to Procedure 5.
3. Run the Diagnostic test, go to System test and execute subtest 04 (Quick charge) described in Chapter 3.
4. When charge is complete, the diagnostics test displays the result code. Check the result code against the table below and perform any necessary check.

Table 2-4 Result code

| Result code | Contents | Check items |
|--------------------|--|--------------------|
| 0 | The battery is charging normally. | Normal |
| 1 | The battery is fully charged. | Normal |
| 2 | The AC adaptor is not attached. | Check 1 |
| 3 | The AC adaptor's output voltage is not normal. | Check 1 |
| 4 | The battery is not installed. | Check 2 |
| 5 | The battery's output voltage is not normal. | Check 3 |
| 6 | The battery's temperature is not normal. | Check 4 |
| 7 | A bad battery is installed. | Check 2 |
| 8 | Any other problems. | Check 5 |

- Check 1 Make sure the AC adaptor and AC power cord are firmly plugged into the DC IN socket and the wall outlet. If these cables are connected correctly, replace the AC adaptor (and/or AC power cord, if necessary).
- Check 2 Make sure the battery is properly installed. If the battery is properly installed, go to Check 3.
- Check 3 The battery pack may be completely discharged. Wait a few minutes to charge the battery pack. If the battery pack is still not charged, go to Check 4.
- Check 4 The battery's temperature is too hot or cold. Return the temperature to a normal operating condition. If the battery pack still is not charged, go to Check 5.
- Check 5 Replace the battery pack with a new one. If the battery pack still is not charged, go to Procedure 5.

Procedure 5 Replacement Check

The system board processor module may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*. Check the connection between the AC adaptor and system board and connection. After checking the connections, perform the following Check 1:

- Check 1 Replace the AC adaptor with a new one. If the AC adaptor is still not functioning properly, perform Check 2.
- Check 2 Replace the system board with a new one following the steps described in Chapter 4, *Replacement Procedures*.

2.4 System Board Troubleshooting

This section describes how to determine if the system board and CPU are defective or not functioning properly. Start with Procedure 1 and continue with the other procedures as instructed.

The procedures described in this section are:

- Procedure 1: Message Check
- Procedure 2: Printer Port LED Check on Boot Mode
- Procedure 3: Diagnostic Test Program Execution Check
- Procedure 4: Replacement Check

Procedure 1 Message Check

When the power is turned on, the system performs the Initial Reliability Test (IRT) installed in the BIOS ROM. The IRT tests each IC on the system board and initializes it.

- If an error message is shown on the display, perform Check 1.
- If there is no error message, go to Procedure 2.
- If DOS or Windows is properly loaded, go to Procedure 3.

Check 1 If one of the following error messages appears on the screen, press **F1** as the message instructs. These errors occur when the system configuration preserved in the RTC memory (CMOS type memory) is not the same as the actual configuration or when the data is lost.

If you press **F1** as the message instructs, returns all system settings to their default values. Then the system reboots.

If error message (b) appears often when the power is turned on, replace the RTC battery. If any other error message displays, perform Check 2.

- (a) *** Bad HDD type ***
Check system. Then press [F1] key
- (b) *** Bad RTC battery ***
Check system. Then press [F1] key
- (c) *** Bad configuration ***
Check system. Then press [F1] key
- (d) *** Bad memory size ***
Check system. Then press [F1] key
- (e) *** Bad time function ***
Check system. Then press [F1] key
- (f) *** Bad check sum (CMOS) ***
Check system. Then press [F1] key
- (g) *** Bad check sum (ROM) ***
Check system. Then press [F1] key

Check 2 The IRT checks the system board. When the IRT detects an error, the system stops or an error message appears.

If one of the following error messages (1) through (17), (22) or (23) appears, go to Procedure 4.

If the error message (18) appears, go to the Keyboard Troubleshooting Procedures in Section 2.7.

If the error message (19), (20) or (21) appears, go to the HDD Troubleshooting Procedures in Section 2.6.

If the error message (21) appears, go to the Optical Drive Troubleshooting Procedures in Section 2.9.

- (1) PIT ERROR
- (2) MEMORY REFRESH ERROR
- (3) TIMER CH.2 OUT ERROR
- (4) CMOS CHECKSUM ERROR
- (5) CMOS BAD BATTERY ERROR
- (6) FIRST 64KB MEMORY ERROR
- (7) FIRST 64KB MEMORY PARITY ERROR
- (8) VRAM ERROR
- (9) SYSTEM MEMORY ERROR
- (10) SYSTEM MEMORY PARITY ERROR
- (11) EXTENDED MEMORY ERROR
- (12) EXTENDED MEMORY PARITY ERROR
- (13) DMA PAGE REGISTER ERROR
- (14) DMAC #1 ERROR
- (15) DMAC #2 ERROR
- (16) PIC #1 ERROR
- (17) PIC #2 ERROR
- (18) KBC ERROR
- (19) HDC ERROR
- (20) Built-in HDD ERROR
- (21) Select Bay ERROR
- (22) TIMER INTERRUPT ERROR
- (23) RTC UPDATE ERROR

Procedure 2 Serial Port Check (Boot Mode)

Check the D port status by a serial port test. The tool for serial port test is shown below.

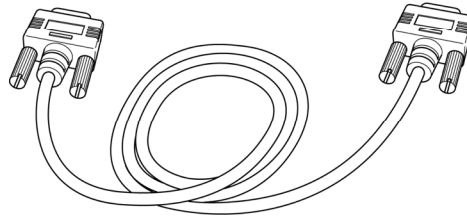
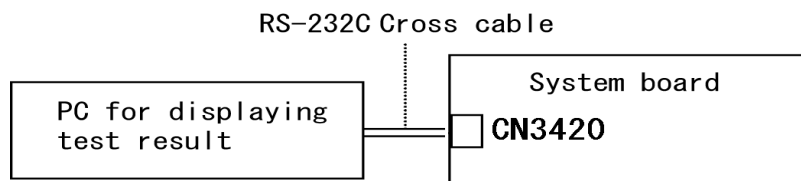


Figure 2-2 A set of tool for serial port test

The test procedures are follows:

1. Connect the RS-232C cross-cable to the connector CN34200 of the system board..
2. Connect the RS-232C Cross-cable to the PC that displays the test results.



4. Boot the computer in DOS mode.
5. Execute GETDPORT.COM in the text menu in CPU REAL mode. (Insert the FD for starting D port into FDD and input “FD starting drive:>dport”.)

The D port status is displayed in the following form;

| | | |
|-------------------|--------------------------|------------------------|
| F100 : 000.000382 | | IRT_CHK_INI/SYSI_START |
| | | |
| D port status | Time (second) to process | Contents of process |

6. When the D port status is FFFF (normal status), go to Procedure 4. When the D port status falls into any other status than FFFF, go to Procedure 3.

Table 2-5 Serial port (Boot mode) error status (1/9)

| D port Status | Test item | Contents |
|---------------|---|---|
| Boot Block | Permission of A20 and clear of software reset bit | |
| | Prohibition of APIC | |
| | Initialization of MCH, ICH | |
| | Initialization of Super I/O | |
| | Initialization of debug port (For models supporting debug port) | |
| | Dummy read of 3 rd Bus data | |
| | Setting of printer port (For models supporting printer port) | |
| F0B0h | PIT CH0 initialization (for HOLD_ON) | |
| | BIOS rewrite factor flag initialization | |
| | CHECK SUM CHECK | Transition to protected mode |
| | | Boot block checksum (skipped when returned from S3) Halts when error occurs |
| | | Checksum other than boot block (skipped when returned from S3) |
| F0B1h | EC/KBC rewrite check | If "rewrite" is requested, go to "BIOS rewrite process" |
| | | Transition to system BIOS IRT (when returned to S3) |
| | Key input | ". When a key is pressed, check if it is Tilde key or Tab key. (skipped when returned from S3) |
| F0B2h | Initialization of SC | HLT at LED=B3H or B4, when error occurs |
| F0B6h | BIOS rewrite request check | If Checksum check error occurred on except Boot Block or rewrite is required by user, go to "BIOS rewrite process". |
| F0B7h | Transits to System BIOS IRT | |
| | BIOS rewrite process | |
| | Initialization of ICH. D31 | |
| | DRAM configuration | |
| | Permission of cache (L1 cache only) | |
| | Memory clear | |
| | Transition to real mode and copy of BIOS to RAM | |

Table 2-5 Serial port (Boot mode) error status (2/9)

| D port Status | Test item | Contents |
|---|---|---|
| F0B9h | Saving of key scan code | |
| | Setting of TASK_1ms_TSC | |
| | FAN control | |
| | Sound initialization (for BEEP sound) | System speaker permission |
| | | Cancel of sound mute |
| | | Setting of volume to max (model that can control volume) |
| | When BIOS, EC/KBC rewriting is requested | Blinks green (cycle:2s, on:1s, off:1s) |
| | When BIOS ROM is abnormal | Blinks orange (cycle:2s, on:1s, off:1s) |
| | When BIOS renewal is prohibited | Blinks orange (cycle:8s, on:4s, off:4s) HLT after BEEP is sounded for 30s (LED=BBH)) |
| | Key input | Prohibition of USB |
| | | BEEP |
| | | Waiting for Key input |
| | Reading of CHGBIOSA.EXE/CHGFIRMA.EXE | FDC RESET |
| | | Setting of parameters for 2HD (1.44MB) |
| | | Reading of first sector, If it is the data of 1.44MB (2HD), the media type is definite. |
| Setting of parameters for 2DD (720KB) | | |
| Retrieval of "CHGBIOSA.EXE" from the root directory. Calculation of directory start head and sector Read 1 sector of the root directory Retrieval of entry of "CHGBIOSA.EXE" /"CHGFIRMA.EXE" from the sector read. | | |
| | Reading of EXE header of "CHGBIOSA.EXE" and "CHGFIRMA.EXE" Key input when error occurred | |
| | Execution of "CHGBIOSA.EXE" and "CHGFIRMA.EXE" | |

Table 2-5 Serial port (Boot mode) error status (3/9)

| D port Status | Test item | Message | |
|---------------------------------|---|---|--|
| F100h | Renewal of a microcode (Only support model) | | |
| | Prohibition of cache | | |
| | Permission of L1/L2 cache in FlashROM area | | |
| | Initialization of H/W (before DRAM recognition) | Initialization of MCH | |
| | | Initialization of ICH6M D30.Func0 | |
| | | Initialization of ICH6M.D31.Func0 | |
| | | Initialization of ICH6M.D31.Func1/2 | |
| | | Initialization of USB Controller | |
| | | Initialization of ICH6M.D31.Func3 | |
| | | Initialization of ICH6M AC97 Audio | |
| Initialization of TI Controller | | | |
| Initialization of PIT channel 1 | (Setting the refresh interval to "30 μ s") | | |
| F101h | Check of DRAM type and size (at cold boot) | When unsupported memory is connected, becoming HLT after beep sound | |
| | SM-RAM stack area test | HLT when DRAM size is 0 HLT When it can not be used as a stack | |
| F102h | Cache configuration | | |
| | Cache permission(L1/L2 cache) | | |
| | CMOS access test (at cold boot) | (HLT when an error is detected) | |
| | Battery level check of CMOS | | |
| | CMOS checksum check | | |
| | Initialization of CMOS data (1) | | |
| | Setting of IRT status | (Setting of boot status and IRT busy flag, The rest bits are 0) | |
| | Storing DRAM size in CMOS | | |
| F103h | Resume branch (at cold boot) | Not resume when a CMOS error occurred | |
| | | Not resume when resume status code is not set | |
| | | Resume error check S3 returning error (1CH) (Resume error LED=7AH) SM-RAM checksum check (Resume error LED=73H) | |

Table 2-5 Serial port (Boot mode) error status (4/9)

| D port Status | Test item | Contents |
|---|--|--|
| (F103h) | | Check of memory configuration change (Resume error LED=73H) |
| | | RAM area checksum check in system BIOS (Resume error LED=79H) |
| | | Expansion memory checksum check resume error (Resume error LED=76H) PnP RAM checksum check (Resume error LED=77H) |
| | | Transition to RESUME-MAIN |
| | Resume error process | Reset of CPU clock to low |
| | | Prohibition of all SMI |
| | | Clearance of resume status |
| | | Return to ROM |
| Turning area of C0000h to EFFFFh to PCI (Prohibition of DRAM) | | |
| Setting of resume error request | | |
| Copying ROM/RAM of system BIOS | (HLT, when error occurs) | |
| F105h | SMRAM initialization (model supporting built-in FDD) | |
| | Check of CPU for HyperThreading (model supporting HTT) | |
| | APIC initialization | |
| | WakeUp factor check | |
| | SMRAM base rewriting and CPU state map saving for BIOS | |
| | Permission of SMI based on ASMI | |
| F106h | Initialization of devices which need initialization before PCI bus initialization. | PIT test (Cold boot only) and initialization |
| | | Setting of test pattern to channel 0 of PIT#0 |
| | | Check whether the set test pattern can be read |
| | | Initialization of PIT channel 0, Setting of timer interruption interval to 55ms |
| | | Initialization of PIT channel 2, Setting of the sound generator frequency to 664Hz |
| | | Test of PIT channel 1 (Check whether the refresh signal works normally in 30 micro-seconds refresh interval.) HLT, when the time is out. |
| | | Test of PIT channel 2 (Check whether the speaker gate works normally.) |
| | | CPU clock measurement |

Table 2-5 Serial port (Boot mode) error status (5/9)

| D port Status | Test item | Contents | |
|---|---|---|--|
| (F106h) | | Check of parameter block A | |
| | | Permission of SMI except auto-off function | |
| | | Control of excess of rated input power | |
| | | Battery discharging current control (1CmA). | |
| | | AC adapter rated over current control | |
| | | Dividing procedures for time measuring by IRT | |
| | | Setting for clock generator | |
| | | CPU Initialization Micro code update Judging of CPU type Geyserville support check Setting of CPU clock to "high" | |
| F107h | Saving memory configuration to buffer | | |
| | Reading of EC version | | |
| | Update of flash ROM type | | |
| | Judging of destination (Japan or other than Japan) based on DMI data | | |
| | CMOS default setting check | Sets default setting if bad battery or bad checksum (ROM, CMOS) is detected | |
| | ACPI table initialization (for execution of option ROM) | | |
| | Initialization of devices which need initialization before PCI bus initialization | Setting of IDE device operation mode | |
| | | Setting of AC'97/Azalia operation mode | |
| | | Initialization of temperature control information | |
| | | KBC initialization | |
| | | VGA display off, Reset control | |
| | | Control of built-in LAN permission/prohibition | |
| | | PCI Express initialization | |
| | | Sound initialization | |
| | | PC multi-box status acquisition (For models supporting Select Bay) | |
| | | HC initialization and Device recognition | |
| SD Memory card recognition and initialization | | | |
| PIC initialization | | | |
| PIC test | | | |
| Password Initialization | | | |

Table 2-5 Serial port (Boot mode) error status (6/9)

| D port Status | Test item | Contents |
|--|--|--|
| F108h | PCI bus initialization (connection of DS Bus) | |
| | Initialization of LAN information | |
| | WakeUp factor check | |
| F109h | Task generation for waiting INIT_PCI completion | |
| | CMOS data initialization (2) | |
| | PnP initialization | |
| | Setting of setup items | |
| | Waiting for the completion of Multi-box status check | |
| | H/W setting based on resource | |
| F10Ah | Task generation for waiting PnP resource making completion | |
| | Serial interruption control | (It carries out, before using interruption processing) (Only YEBISU support model) |
| | PnP H/W initialization | PC card slot initialization |
| | | SIO initialization (For models supporting SIO) |
| | | FIR initialization (For models supporting FIR) |
| | PCI automatic configuration | Making of work for automatic configuration |
| | | Acquisition of PCI IRQ |
| | | Configuration |
| | | Saving of VGA configuration result |
| | F10Bh | |
| Initialization of H/W needed after PCI configuration | | Printer port setting (model supporting Printer port) |
| | | HDD initialization sequence start |
| | | FDD initialization sequence start (model supporting built-in FDD) |
| Enabling power off | | |
| Output code generation | | |
| F10Ch | FIRST_64KB_CHECK | (Check of first 64KB memory) |
| F10Dh | INIT_INT_VECTOR | (Initialization of vectors) |
| F10Eh | INIT_NDP | (Initialization of NDP) |

Table 2-5 Serial port (Boot mode) error status (7/9)

| D port Status | Test item | Contents |
|---------------|---------------------------|--|
| F10Fh | INIT_SYSTEM | (Initialization of system) |
| | | Storing of CMOS error information to IRT_ERR_STS_BUF |
| | | Timer initialization start |
| | | EC initialization & Reading of battery information |
| | | Update of system BIOS (Update EDID information for LCD) |
| F110h | INIT_DISPLAY | (Waiting for VGA chip initialization completion, VGA BIOS initialization) |
| F111h | VGA POST | |
| F113h | DISP_LOGO | (Logo displaying) |
| F114h | SYS_MEM_CHECK | (Check of conventional memory) (Boot) |
| F115h | EXT_MEM_CHECK | (Exception check in protected mode) (Boot) |
| F116h | INIT_SYS_MEM | (Initialization of conventional memory) (Reboot) (LED=17h if error occurred during exception check in protected mode) |
| F118h | CHK_DMA_PAGE | (Check of DMA Page Register) (Boot) |
| F119h | CHECK_DMACH | (Check of DMACH) (Boot) |
| F11Ah | INIT_DMACH | (Initialization of DMACH) (Boot) |
| F11Bh | CHECK_PRT | (Check of printer existence) (For models supporting Printer port) |
| F11Ch | CHECK_SIO | (Check of SIO) (model supporting SIO) |
| F11Dh | BOOT_PASSWORD | (Check of password) |
| | | Waiting for FDD initialization completion (For models supporting built-in FDD) |
| | (In the case of "Reboot") | Waiting for HDD initialization completion |
| | | Check of key input during IRT (waiting for KBC initialization completion) Initialization of ATA priority |
| | (In the case of "Boot") | Loading processing of BM (Only model which is supporting the finger point leader) |
| | | Initialization of BM(Only model which is supporting the finger point leader) |
| | | Check of key input during IRT (waiting for KBC initialization completion) |
| | | A password input is performed. |

Table 2-5 Serial port (Boot mode) error status (8/9)

| D port Status | Test item | Contents |
|---|-----------------|---|
| (F11Dh) | | I/O LOCK Processing (For models supporting I/O LOCK) |
| | | Opening of BM (Only model which is supporting the finger point leader) |
| F11Eh | EX_IO_ROM_CHECK | (Check of option I/O ROM) |
| F11Fh | PRE_BOOT_SETUP | Saving of value in 40:00h (For SIO saving/restoring) |
| | | Setting of font address for resume password |
| | | Setting of repeat parameter for USB KB |
| | | Acquisition of keys pressed during IRT |
| | | Storing of T_SHADOW_RAM_SIZE |
| | | Update of system resource before boot |
| | | Rewriting of memory map data of INT15h E820h function |
| | | Waiting for AC-Link initialization completion (For models supporting AC-Link) |
| | | Updating of table for DMI |
| | | Copy of ACPI table to top of expansion memory |
| | | Waiting for writing of PSC version to BIOS completion |
| | | Waiting for clock generator setting completion When error occurred, halts at LED=21H |
| | | Waiting for serial port initialization completion (For models supporting SIO) |
| | | Cancel of NMI Mask |
| | | Taking out TIT check sum |
| | | Clear of the IRT flag on Runtime side |
| | | Update of check sum on Runtime side |
| Hibernation branch (For models supporting BIOS Hibernation) | | |
| Initialization of Bluetooth (For models supporting Bluetooth) | | |
| Check of existence of object maintenance cards | | |
| Prohibition of unused PC cards | | |
| Setting Wakeup status data for ACPI | | |

Table 2-5 Serial port (Boot mode) error status (9/9)

| D port Status | Test item | Contents |
|---------------|------------------------------------|---|
| (F11Fh) | | HW initialization before Boot, Waiting for initialization completion |
| | | Notifies the DVI connection status to VGA BIOS (For models supporting DVI) |
| | | Setting of battery save mode |
| | | Setting of date |
| | | Waiting for Bluetooth initialization completion (For models supporting Bluetooth) |
| | | Update of DMI Wakeup factor, Update of SM-BIOS structure table |
| | | PCI device configuration space close |
| | | Cache control |
| | | Process for CPU (Make the CPU clock to be set by SETUP) |
| | | Waiting of motor-off completion of disabled HDD |
| | | Final setting of USB FDD information |
| | | Post processing of PRE_BOOT_SETUP Clears PWRBTN_STS Enables POWER Button |
| F121h | Clearness of IRT status | |
| | Update of Checksum on Runtime side | |
| FFFFh | | |

Procedure 3 Diagnostic Test Program Execution Check

Execute the following tests from the Diagnostic Test Menu. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform these tests.

1. System test
2. Memory test
3. Keyboard test
4. Display test
5. Floppy Disk test
6. Async test
7. Hard Disk test
8. Real Timer test
9. NDP test
10. Expansion test
11. CD-ROM/DVD-ROM test
12. Wireless LAN test
13. Sound test
14. LAN/Modem/Bluetooth/IEEE1394 test

If an error is detected during these tests, go to Procedure 4.

Procedure 4 Replacement Check

The system board connectors may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform Check 1.

Check 1 Visually check for the following:

- a) Cracked or broken connector housing
- b) Damaged connector pins

If their connectors are in good condition, but there is still a problem, go to Check 2.

Check 2 The system board may be damaged. Replace the system board with a new one following the steps described in Chapter 4, *Replacement Procedures*.

2.5 USB FDD Troubleshooting

This section describes how to determine if the USB FDD is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: USB FDD Head Cleaning Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Replacement Check

Procedure 1 USB FDD Head Cleaning Check

USB FDD head cleaning operation details are given in Chapter 3, *Tests and Diagnostics*.

Insert the Diagnostics Disk in the computer's floppy disk drive, turn on the computer and run the test. Clean the USB FDD heads using the cleaning kit. If the USB FDD still does not function properly after cleaning, go to Procedure 2.

If the test program cannot be executed, go to Procedure 3.

Procedure 2 Diagnostic Test Program Execution Check

Insert the Diagnostics Disk in the USB FDD, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the diagnostics test procedures.

Floppy disk drive test error codes and their status names are listed in Table 2-6. Make sure the floppy disk is formatted correctly and that the write protect tab is disabled. If any other errors occur while executing the FDD diagnostics test, go to Check 1.

Table 2-6 FDD error code and status

| Code | Status |
|------|------------------------|
| 01h | Bad command error |
| 02h | Address mark not found |
| 03h | Write protected |
| 04h | Record not found |
| 06h | Media removed |
| 08h | DMA overrun error |
| 09h | DMA boundary error |
| 10h | CRC error |
| 20h | FDC error |
| 40h | Seek error |
| 60h | Not drive error |
| 80h | Time out error |
| EEh | Write buffer error |

Check 1 If the following message appears, disable the write protect tab on the floppy disk. If any other message appears, perform Check 2.

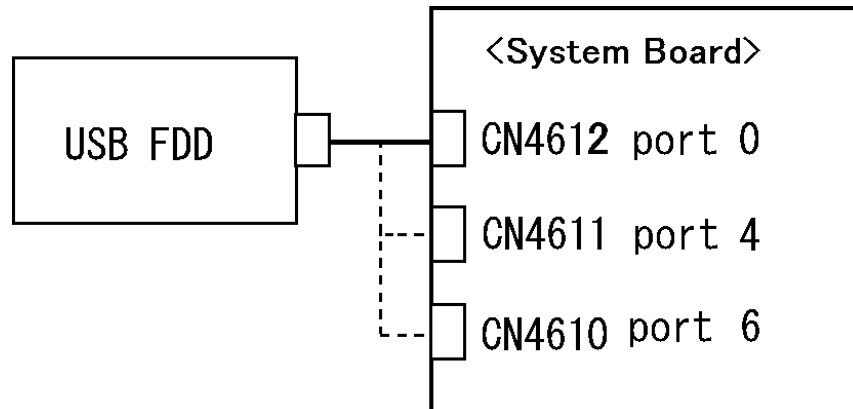
Write protected

Check 2 Make sure the floppy disk is formatted correctly. If it is, go to Procedure 3.

Procedure 3 Connector Check and Replacement Check

The USB FDD is connected to the System Board.

- Check 1 When using the USB port, make sure the USB FDD cable is firmly connected to CN4612 , CN4611 or CN4610 on the System board.



If any of the connections are loose, reconnect firmly and repeat Procedure 2.
If any of the connections is damaged, or there is still an error, go to Check 2.

- Check 2 The USB FDD or USB FDD cable may be defective or damaged. Replace it with a new one. If the USB FDD is still not functioning properly, perform Check 3.
- Check 3 Replace the System board with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.6 HDD Troubleshooting

This section describes how to determine if the HDD is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Message Check

Procedure 2: Partition Check

Procedure 3: Format Check

Procedure 4: Diagnostic Test Program Execution Check

Procedure 5: Connector Check and Replacement Check

CAUTION: *The contents of the hard disk will be erased when you execute the HDD troubleshooting procedures. Transfer the contents of the hard disk to floppy disks or other storage media.*

Procedure 1 Message Check

When the computer's HDD does not function properly, some of the following error messages may appear on the display. Start with Check 1 below and perform the other checks as instructed.

Check 1 If any of the following messages appear, go to Procedure 5. If the following messages do not appear, perform Check 2.

HDC ERROR (After 5 seconds this message will disappear.)

or

IDE #0 ERROR (After 5 seconds this message will disappear.)

or

IDE #1 ERROR (After 5 seconds this message will disappear.)

Check 2 If either of the following messages appears, go to Procedure 2. If the following messages do not appear, perform Check 3.

Insert system disk in drive
Press any key when ready

or

Non-System disk or disk error
Replace and press any key

Check 3 Make sure the Hard Disk option is set to not used. If it is set to not used, choose another setting and restart the computer. If the problem still exists, go to Procedure 2.

Procedure 2 Partition Check

Insert the Toshiba MS-DOS system disk and restart the computer with U key holding down. Perform the following checks:

- Check 1 Type **C:** and press **Enter**. If you cannot change to drive C, go to Check 2. If you can change to drive C, go to Check 3.
- Check 2 Type **FDISK** and press **Enter**. Choose Display Partition Information from the FDISK menu. If drive C is listed, go to Check 3. If drive C is not listed, return to the FDISK menu and choose the option to create a DOS partition on drive C. Restart the computer from the Toshiba MS-DOS system disk. If the problem still exists, go to Procedure 3.
- Check 3 If drive C is listed as active in the FDISK menu, go to Check 4. If drive C is not listed as active, return to the FDISK menu and choose the option to set the active partition for drive C. Restart the computer and then go to Procedure 3.
- Check 4 Remove the FD and restart the computer. If the problem still exists, go to Procedure 3.
- Check 5 Using the **SYS** command on the Toshiba MS-DOS system disk, install system files on the HDD.

If the following message appears on the display, the system files have been transferred to the HDD. Restart the computer. If the problem still exists, go to Procedure 3.

System transferred

NOTE: *If the computer is running Windows 2000, OSR2 or higher and the hard disk has more than 512 MB capacity, the FDISK program will ask if you need support for a partition larger than 2GB. Select Y for large partition support; however, be sure to read the precaution regarding access by other operating systems.*

Procedure 3 Format Check

The computer's HDD is formatted using the low level format program and the MS-DOS FORMAT program. To format the HDD, start with Check 1 below and perform the other steps as required.

- Check 1 Format the HDD and transfer system files using **FORMAT C:/S/U**. If the following message appears on the display, the HDD is formatted.

Format complete

If an error message appears on the display, refer to the Toshiba MS-DOS Manual for more information and perform Check 2.

- Check 2 Using the Diagnostics Disk, format the HDD with a low level format option. Refer to Chapter 3, *Tests and Diagnostics* for more information about the diagnostic program.

If the following message appears on the display, the HDD low level format is complete. Partition and format the HDD using the MS-DOS FORMAT command.

Format complete

If you cannot format the HDD using the Tests and Diagnostic program, go to Procedure 4.

Procedure 4 Diagnostic Test Program Execution Check

The HDD test program is stored in the Diagnostics Disk. Perform all of the HDD tests in the Hard Disk Drive Test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the HDD test program.

If an error is detected during the HDD test, an error code and status will be displayed. Replace the HDD with a new one following the instructions in Chapter 4, *Replacement Procedures*. The error codes and statuses are listed in Table 2-7. If an error code is not generated or the problem still exists, go to Procedure 5.

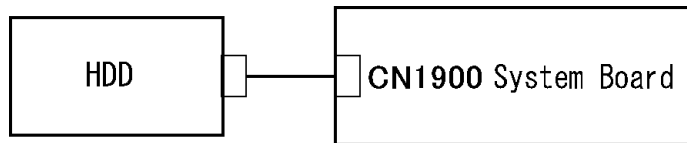
Table 2-7 HDD error code and status

| Code | Status |
|------|------------------------|
| 01h | Bad command error |
| 02h | Address mark not found |
| 04h | Record not found |
| 05h | HDC not reset |
| 07h | Drive not initialized |
| 08h | Overrun error (DRQ ON) |
| 09h | DMA boundary error |
| 0Ah | Bad sector error |
| 0Bh | Bad track error |
| 10h | ECC error |
| 11h | ECC recover enable |
| 12h | DMA CRC error |
| 20h | HDC error |
| 40h | Seek error |
| 80h | Time out error |
| AAh | Drive not ready |
| BBh | Undefined error |
| CCh | Write fault |
| E0h | Status error |
| EEh | Access time error |
| DAh | No HDD |

Procedure 5 Connector Check and Replacement Check

The HDD may be disconnected, or the HDD or the system board may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1 Make sure the HDD is firmly connected to CN19000 on the system board.



If any of the connections are loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

- Check 2 The HDD may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.
- Check 3 The System board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.7 Keyboard and Dual point Troubleshooting

To determine if the computer's keyboard or touch pad is functioning properly, perform the following procedures. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

Execute the Keyboard Test in the Diagnostic Program. Refer to Chapter 3, *Tests and Diagnostics*, for more information on how to perform the test program.

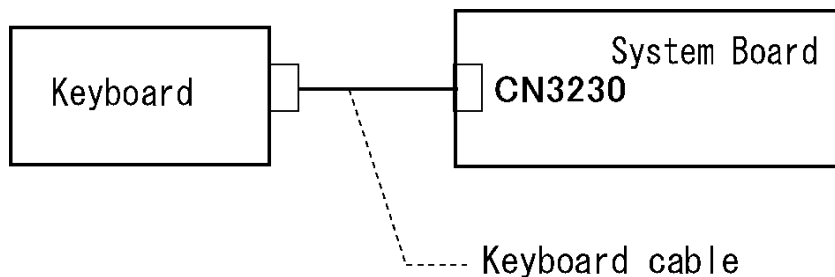
If an error occurs, go to Procedure 2. If an error does not occur, the keyboard is functioning properly.

Procedure 2 Connector Check and Replacement Check

The keyboard, Dual point or sensor/switch board may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

1. If the keyboard or AccuPoint malfunctions, start with Check 1.
2. If the Dual point malfunctions, start with Check 3.
3. If the power switch, InTouch button or Presentation button malfunctions, start with Check 5.

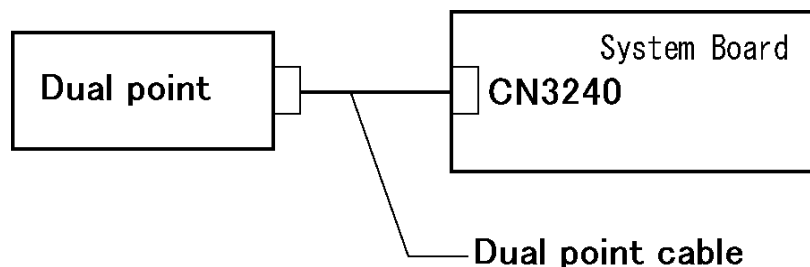
Check 1 Make sure the keyboard cable is securely connected to CN3230 on the system board.



If the connection is loose, reconnect firmly. If there is still an error, go to Check 2.

Check 2 The keyboard or its cable may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 5.

Check 3 Make sure the Dual point cable is firmly connected to CN3240 on the system board.



If the connection is loose, reconnect firmly. If there is still an error, go to Check 4.

Check 4 The Dual point or the Dual point cable may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 5.

Check 5 The system board may be damaged. Replace it with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.8 Display Troubleshooting

This section describes how to determine if the computer's display is functioning properly. Start with Procedure 1 and continue with the other procedures as instructed.

Procedure 1: External Monitor Check

Procedure 2: Diagnostic Test Program Execution Check

Procedure 3: Connector Check and Cable Check

Procedure 4: Replacement Check

Procedure 1 External Monitor Check

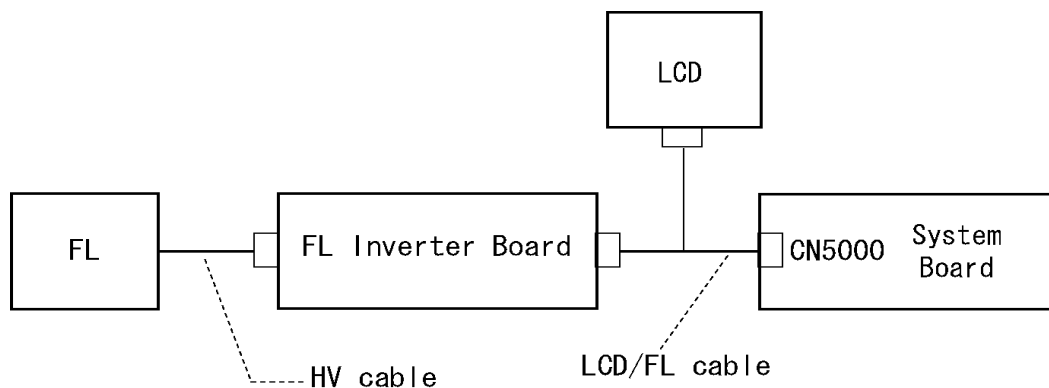
Connect an external monitor and turn on the computer. If there is no problem on it, the internal LCD may be defective. Go to Procedure 3. If there is any problem on the external monitor, the system board may be defective. Go to Procedure 2.

Procedure 2 Diagnostic Test Program Execution Check

The Display Test program is stored on the computer's Diagnostics disk. This program checks the display controller on the system board. Insert the Diagnostics disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics* for details. If an error is detected, go to Procedure 3.

Procedure 3 Connector Check and Cable Check

Check 1 The LCD, FL, FL Inverter Board and System Board are connected by the HV cable and LCD/FL cable as shown below. Check the connections. The connectors may be disconnected or damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*.



If the connection is loose, reconnect firmly and restart the computer. If there is still an error, go to Procedure 4.

Procedure 4 Replacement Check

The FL, FL inverter board, LCD module, and system board are connected to display circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks:

1. If the FL does not light, perform Check 1.
2. If characters or graphics are not displayed clearly, perform Check 1.
3. If some screen functions do not operate properly, perform Check 2.
4. If the FL remains lit when the display is closed, perform Check 4.

Check 1 Replace the FL with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check 2.

Check 2 Replace the LCD module with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check 3.

Check 3 Replace the display cable (FL cable and LCD cable) with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again. If the problem still exists, perform Check 4.

Check 4 The display controller on the system board may be damaged. Replace the system board with a new one following the instructions in Chapter 4, *Replacement Procedures*.

2.9 Optical Drive Troubleshooting

This section describes how to determine if the optical drive (Super Multi drive) in the Slim Select Bay is functioning properly. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

The CD-ROM/DVD-ROM test program is stored in the Diagnostics Disk.

For the test, prepare test Media.

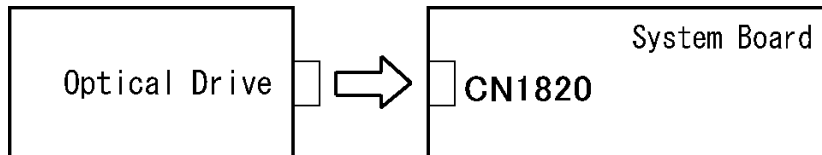
Then insert the Diagnostics Disk in the computer's floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the diagnostics test procedures.

If any errors occur while executing the CD-ROM/DVD-ROM test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The optical drive (Super Multi drive) is connected to the system board. The connectors may be disconnected from the system board or may be damaged. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

Check 1 Make sure the drive to test is firmly connected to CN1820 on the system board.



If the connection is loose, reconnect firmly and repeat Procedure 1. If there is still an error, go to Check 2.

Check 2 The drive may be defective or damaged. Replace the drive with a new one. If there is still an error, go to Check 3.

Check 3 Replace the system board with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.10 Modem Troubleshooting

This section describes how to determine if the computer's modem is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

Insert the LAN/Modem/Bluetooth/IEEE1394 test program in the USB floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics*, for more information about the diagnostics test procedures.

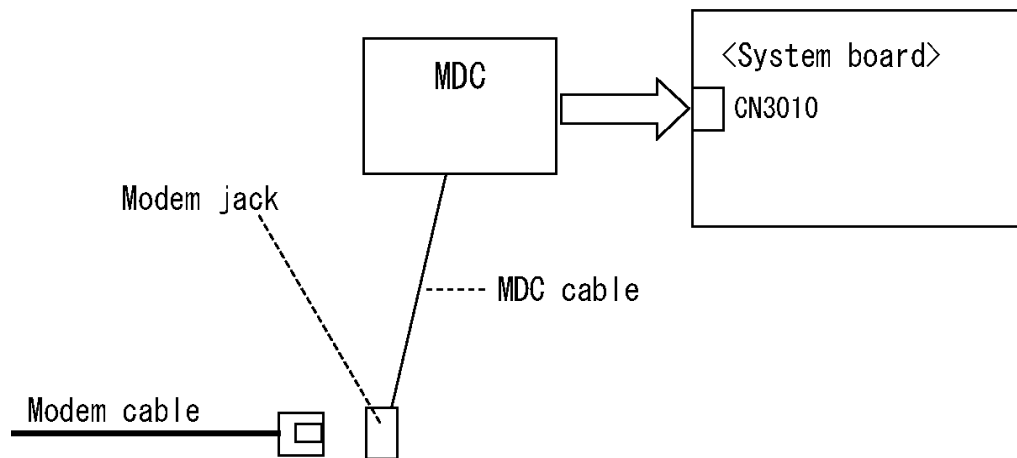
If any errors occur while executing the Sound/Modem/LAN test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The Modem is installed as a MDC (Modem Daughter Card). If the modem malfunctions, there may be a bad connection between the MDC and the system board. Or the MDC, system board or their connectors might be damaged.

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

- Check 1 Make sure the MDC is firmly connected to CN3010 on the system board and the Modem cable is firmly connected to the Modem jack.



If a connector is disconnected, connect it firmly and repeat Procedure 1. If the modem is still not functioning properly, perform Check 2.

- Check 2 The MDC may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the modem is still not functioning properly, perform Check 3.
- Check 3 The modem jack or MDC cable may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*. If the modem is still not functioning properly, perform Check 4.
- Check 4 The system board may be defective or damaged. Replace it with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.11 LAN Troubleshooting

This section describes how to determine if the computer's LAN is functioning properly. Perform the steps below starting with Procedure 1 and continue with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check and Replacement Check

Procedure 1 Diagnostic Test Program Execution Check

Execute the LAN test program available as part of the LAN/Modem/Bluetooth/IEEE1394 test program. Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

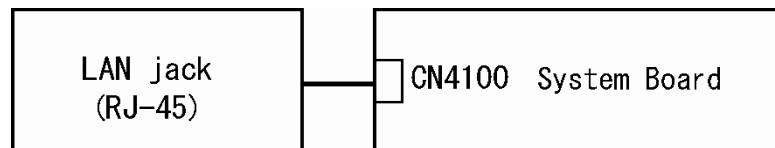
If any error is detected by the test, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The RJ-45 jack with LAN cable is connected to the system board. If the LAN malfunctions, the system board might be damaged.

Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following check:

Check 1 Make sure the RJ-45 jack is firmly connected to J4100 on the system board.



If the connector is disconnected, connect it firmly and repeat Procedure 1. If the LAN port is still not functioning properly, perform Check 2.

Check 2 The RJ-45 jack may be defective or damaged. Replace the RJ-45 jack with a new one. If the LAN port is still not functioning properly, perform Check 3.

Check 3 The system board may be defective or damaged. Replace the system board with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.12 Bluetooth Troubleshooting

This section describes how to determine if the computer's Bluetooth is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connection Check

Procedure 3: Replacement Check

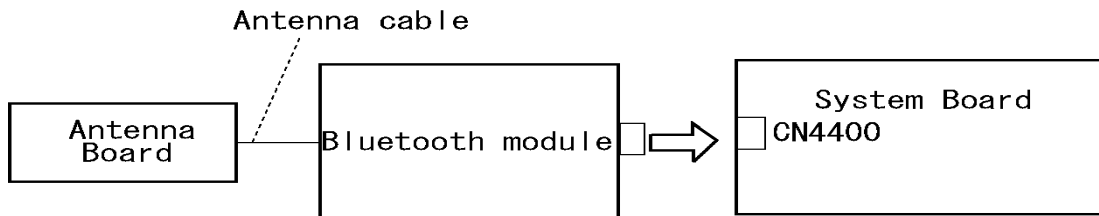
Procedure 1 Diagnostic Test Program Execution Check

Make sure the wireless switch on the left side of the computer is turned "On". If it is not, slide the switch toward the back of the computer to turn it on.

- Check 1 Execute Bluetooth test program. Perform the test following the instructions described in Chapter 3, Bluetooth Test Program. You will need a second computer that can communicate by the Bluetooth. If the computer passes the test, the function is correctly working. If the computer does not pass the test, go to check 2.
- Check 2 The Bluetooth module may be defective or damaged. Replace it with a new one. Then perform the test program again. If the computer still does not pass the test, go to Procedure 2.

Procedure 2 Connection Check

The Bluetooth function wiring diagram is shown below:



Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure the Bluetooth module is firmly connected to CN4400 on the sound board.

If the connector is disconnected, connect it firmly. If the Bluetooth module is still not functioning properly, perform Check 2.

Check 2 Make sure the Bluetooth antenna cable is firmly connected to the Bluetooth module.

If the Bluetooth antenna cable is disconnected, connect it firmly. If the Bluetooth module is still not functioning properly, go to Procedure 3.

Procedure 3 Replacement Check

The Bluetooth antenna, Bluetooth module, sound board and system board are connected to the circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks:

- Check 1 The Bluetooth module may be defective or damaged. Replace the Bluetooth module with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth is still not functioning properly, perform Check 2.
- Check 2 The Bluetooth antenna may be defective or damaged. Replace the Bluetooth antenna with a new one following the steps in Chapter 4, *Replacement Procedures*. If the Bluetooth is still not functioning properly, perform Check 3.
- Check 3 The system board may be defective or damaged. Replace the system board with a new one following the steps in Chapter 4, *Replacement Procedures*.

2.13 Wireless LAN Troubleshooting

This section describes how to determine if the computer's Wireless LAN is functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Transmitting-Receiving Check

Procedure 2: Antenna Connection Check

Procedure 3: Replacement Check

Procedure 1 Transmitting-Receiving Check

Make sure the wireless switch on the left side of the computer is turned "On". If it is not, slide the switch toward the back of the computer to turn it on.

Refer to Chapter 3, *Tests and Diagnostics* for more information on how to perform the test program.

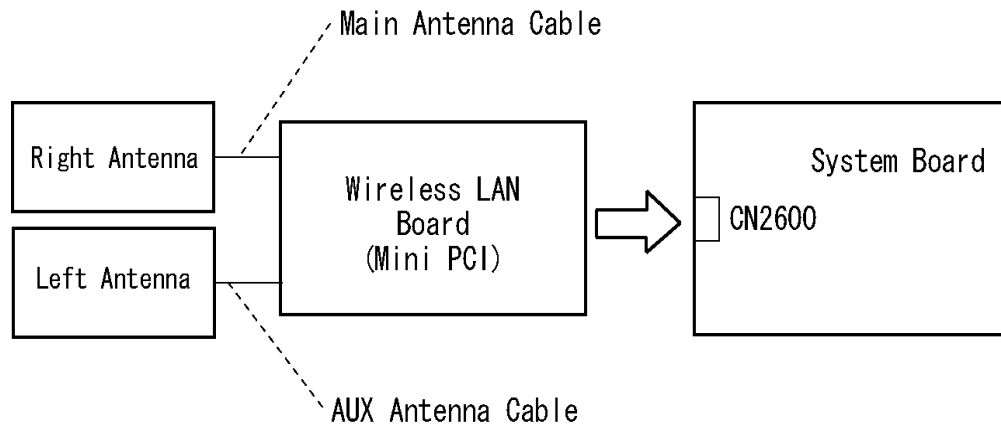
Check 1 Execute test program for the wireless LAN function to check the transmitting-receiving function of the wireless LAN. You will need a second computer that can communicate by the wireless LAN.

If the computer passes the test, the function is correctly working.

If the computer does not pass the test, perform Procedure 2.

Procedure 2 Antenna Connection Check

The wireless LAN wiring diagram is shown below:



Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures*, and perform the following checks:

Check 1 Make sure the wireless LAN board is firmly connected to CN2600 on the system board.

If the connector is disconnected, connect it firmly. If the wireless LAN board is still not functioning properly, perform Check 2.

Check 2 Make sure the wireless LAN antenna cables are firmly connected to the wireless LAN board.

If the wireless LAN antenna cables are disconnected, connect them firmly. If the wireless LAN board is still not functioning properly, go to Procedure 3.

Procedure 3 Replacement Check

The wireless LAN antenna, wireless LAN board and the system board are connected to the circuits. Any of these components may be damaged. Refer to Chapter 4, *Replacement Procedures*, for instructions on how to disassemble the computer and then perform the following checks:

- Check 1 The wireless LAN board may be defective or damaged. Replace the board with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 2.
- Check 2 The wireless LAN antenna may be defective or damaged. Replace the antenna with a new one following the steps in Chapter 4, *Replacement Procedures*. If the problem still exists, perform Check 3.
- Check 3 The system board may be defective or damaged. Replace the board with a new one following the instructions in Chapter 4, *Replacement Procedures* and test the display again.

2.14 Sound Troubleshooting

This section describes how to determine if the computer's sound functions are functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Diagnostic Test Program Execution Check

Procedure 2: Connector Check

Procedure 3: Replacement Check

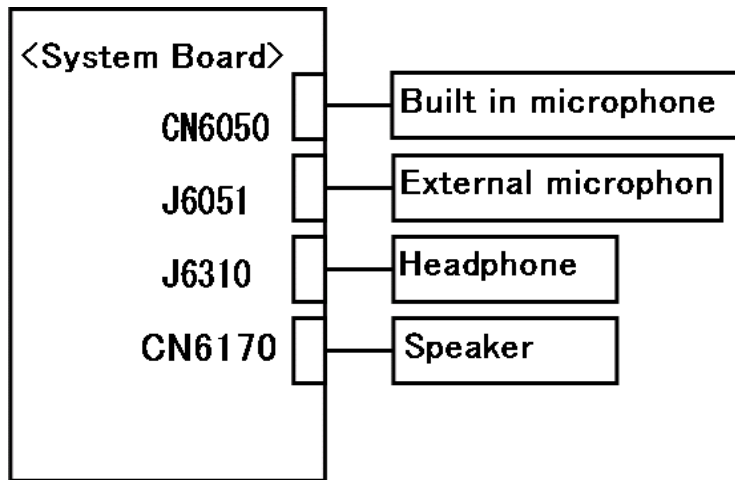
Procedure 1 Diagnostic Test Program Execution Check

Insert the Sound test program in the USB floppy disk drive, turn on the computer and run the test. Refer to Chapter 3, *Tests and Diagnostics*, for details.

If an error is detected, go to Procedure 2.

Procedure 2 Connector Check

The sound function-wiring diagram is shown below:



Any of the connections may be disconnected. Disassemble the computer following the steps described in Chapter 4, *Replacement Procedures* and perform the following checks:

1. If the speakers do not work correctly, perform Check 1.
2. If the headphone does not work correctly, perform Check 2.
3. If the external microphones do not work correctly, perform Check 3.
4. If the Built in microphones do not work correctly, perform Check 4.

- Check 1 If the speakers do not work properly, the speaker cable may be disconnected. Make sure the speaker cable is firmly connected to CN6170 on the system board. If the stereo speakers are still not functioning properly, go to Procedure 3.
- Check 2 If the headphone does not work properly, the headphone cable may be disconnected. Make sure the headphone cable is firmly connected to J6310 on the system board. If the sound function still does not work properly, Procedure 3.
- Check 3 If the external microphones do not work properly, external microphone cable may be disconnected. Make sure the external microphone cable is firmly connected to J6051 on the system board. If the external microphones are still not functioning properly, go to Procedure 3.
- Check 4 If the Built in microphone do not work properly, the Built in microphone cable may be disconnected. Make sure the Built in microphone cable is firmly connected to CN6050 on the system board. If the Built in microphone are still not functioning properly, go to Procedure 3.

Procedure 3 Replacement Check

- Check 1 If the speakers do not sound properly, the speaker may be defective or damaged. Replace it with a new one. If the speakers still do not work properly, go to Check 3.
- Check 2 If the Built in microphone do not sound properly, the Built in microphone may be defective or damaged. Replace it with a new one. If the Built in microphone still do not work properly, go to Check 3.
- Check 3 If the headphone or external microphone does not sound properly, the system board may be defective or damaged. Replace the system board with a new one.

2.15 SD Card Slot Troubleshooting

This section describes how to determine if the computer's SD card functions are functioning properly. Perform the steps below starting with Procedure 1 and continuing with the other procedures as required.

Procedure 1: Check on Windows

Procedure 2: Connector Check and Replacement Check

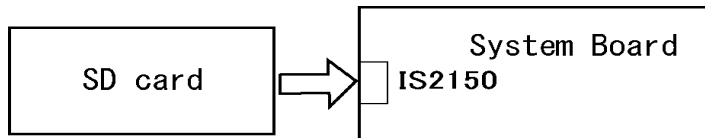
Procedure 1 Check on Windows

Insert an SD card into the slot. Check if the installed Windows recognizes automatically the SD card and the data in the SD card can be read.

If the card is not recognized or data are not read, go to Procedure 2.

Procedure 2 Connector Check and Replacement Check

The SD card is connected to IS2150 on the System Board.



- Check 1 The SD card and the System Board may be disconnected. Make sure the SD card is firmly inserted to IS2150 on the System Board. If not, insert it firmly. If the SD card is still not functioning properly, perform Check 2.
- Check 2 The SD card may be faulty. Replace it with a new one following the step in Chapter 4 *Replacement Procedures*. If the problem continues, perform Check 3.
- Check 3 The System Board may be faulty. Replace it with a new one following the step in Chapter 4 *Replacement Procedures*.

2.16 Fingerprint sensor Troubleshooting

CAUTION: To delete the account for confirming the fingerprint operation, it is necessary to log on by the account with the management authority. If the password has been set to log on, ask the Log-ON password to the user.

To check if the Fingerprint sensor works correctly or not, follow the troubleshooting procedures below as instructed.

When failed in Procedure 1 to Procedure 3, execute Procedure 4.

Procedure 1: Setting Windows Log-ON password

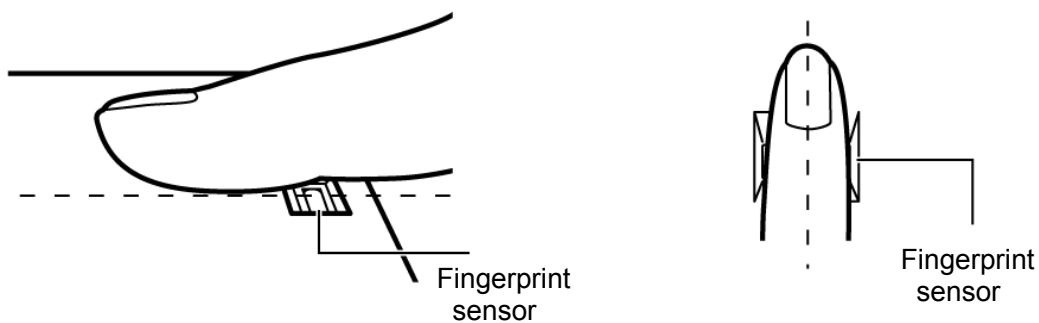
Procedure 2: Registration of fingerprint

Procedure 3: Authentication of fingerprint

Procedure 4: Connector Check and Replacement Check

CAUTION: Scan your finger shown below.

1. Lay your finger straight to the sensor and put lightly the first joint of your finger at the centerline of the fingerprint sensor.
2. Slide slowly your finger from the first joint to fingertip at constant speed. When not recognized, adjust the speed.

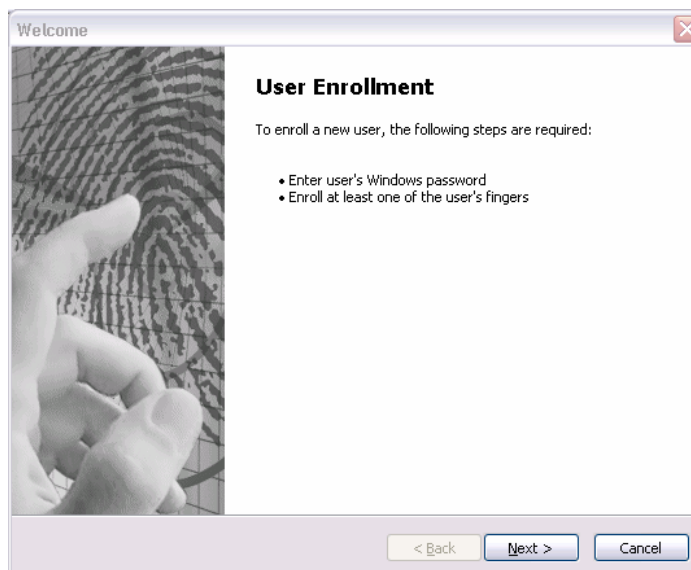


Procedure 1 Setting Windows Log-ON password

1. Open [User Account] from [Control Panel].
2. Click [User Account].
3. Click the icon of the account (user's name) that you want to set the password.
4. Click "Create Account".
5. Type a password in "Type a new password".
6. Press **Tab** key.
7. Type the password again.
8. Click "Create Password" button.
9. When "Do you want to make your files and folders private" appears in [Computer administrator], click [Yes, Make Private].

Procedure 2 Registration of fingerprint

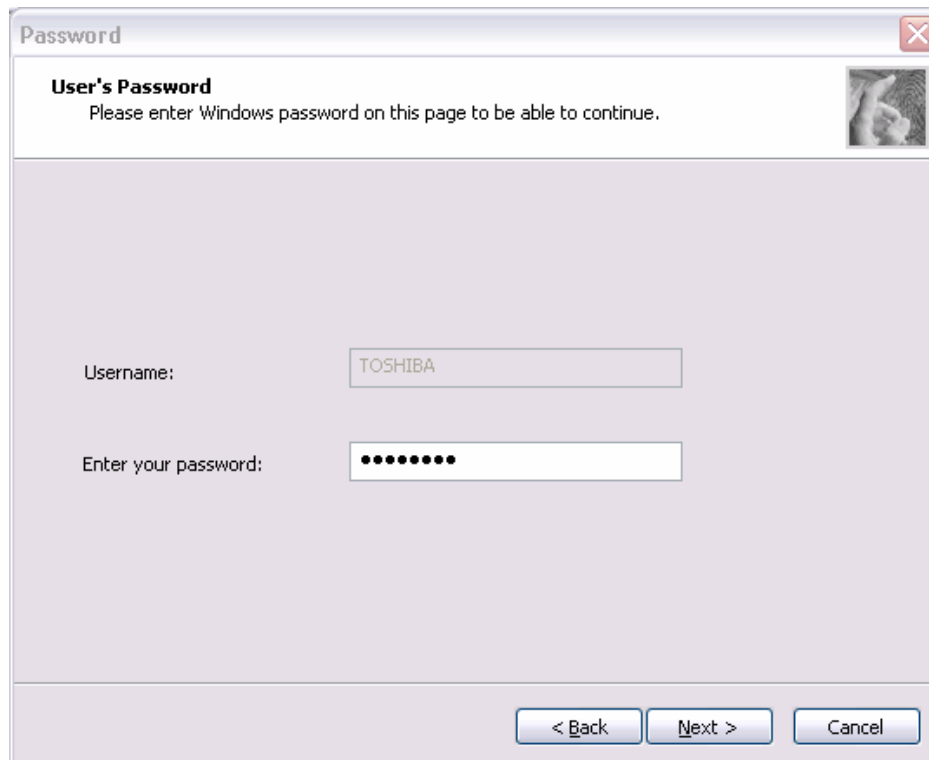
1. Logon by user's account to register the fingerprint.
2. Open [Start] → [All Programs] → [Protector Suite QL] → [User Enrollment].
3. After displaying [User Enrollment], click [Next].



[User's Passport] appears in “Enter your password”. Click [Next].

When the finger print has been enrolled, [User's Password] appears. Slide your finger enrolled or type the password. Click [Next].

5. Type the Windows login password in “Enter your password” and click [Next].
[User's Password] appears.



Password

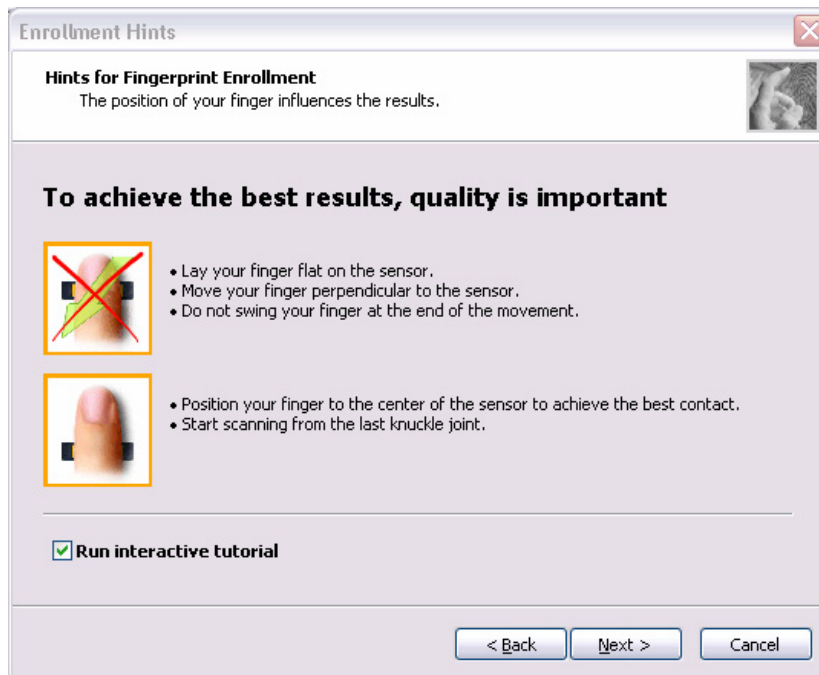
User's Password
Please enter Windows password on this page to be able to continue.

Username: TOSHIBA

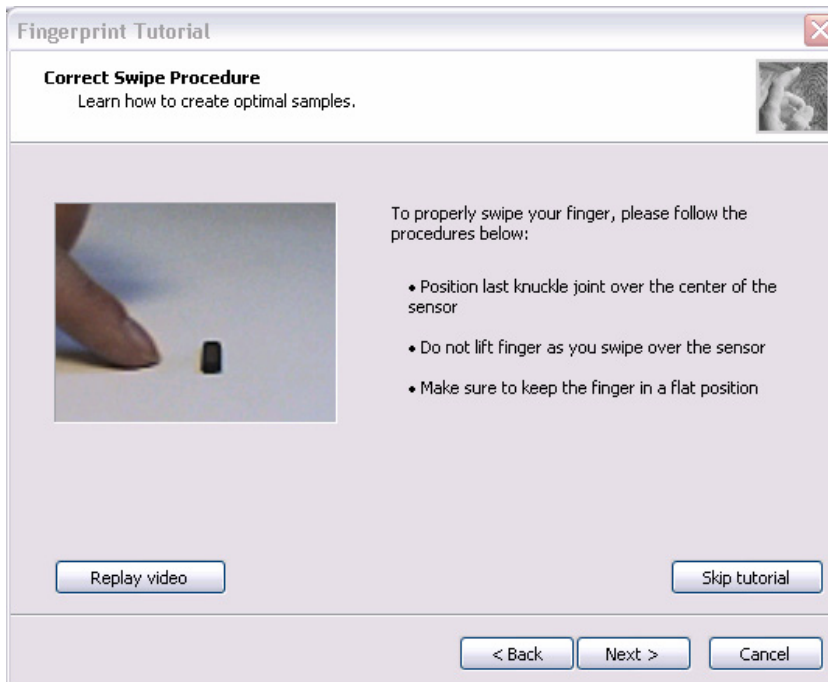
Enter your password: ●●●●●●●●●●

< Back Next > Cancel

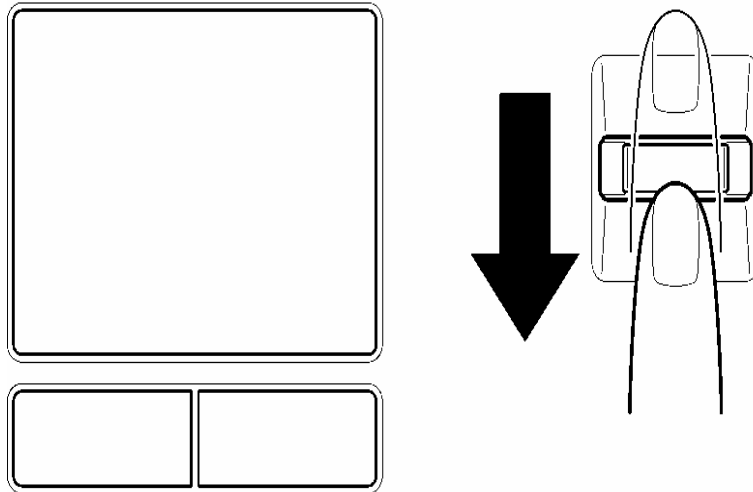
6. Confirm that the box of [Run interactive tutorial] is checked (when proceeding with seeing Tutorial) and click [Next].



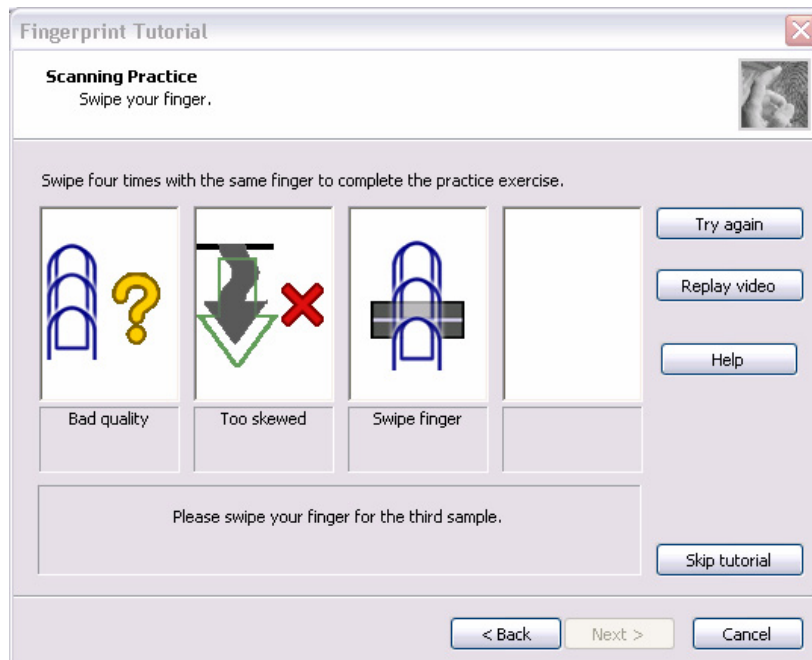
7. Watch the Video carefully, click [Next].



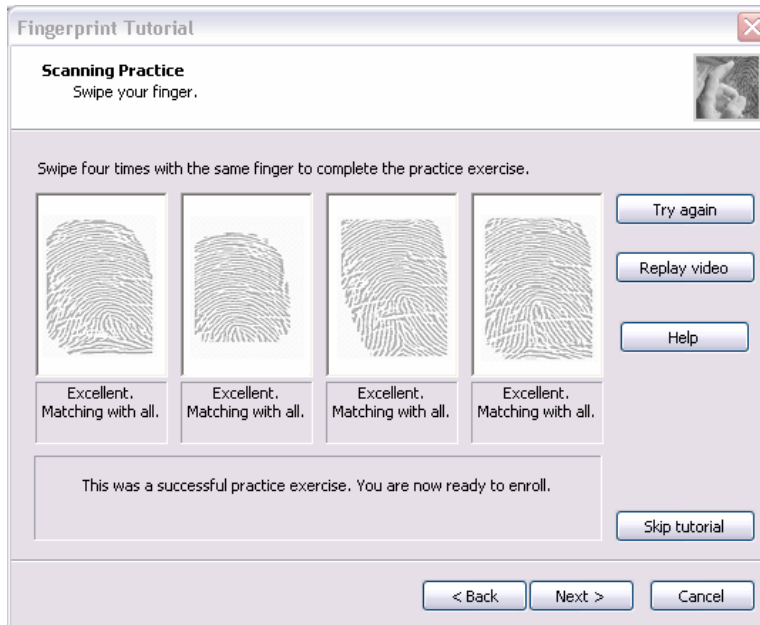
- Put lightly your finger on the fingerprint sensor at the right side of the touchpad panel and slide your finger sideways



Slide your finger four times. Four boxes are filled with fingerprints. At this time, when you click the [Replay video], you can watch the video that you have watched in Procedure 6.

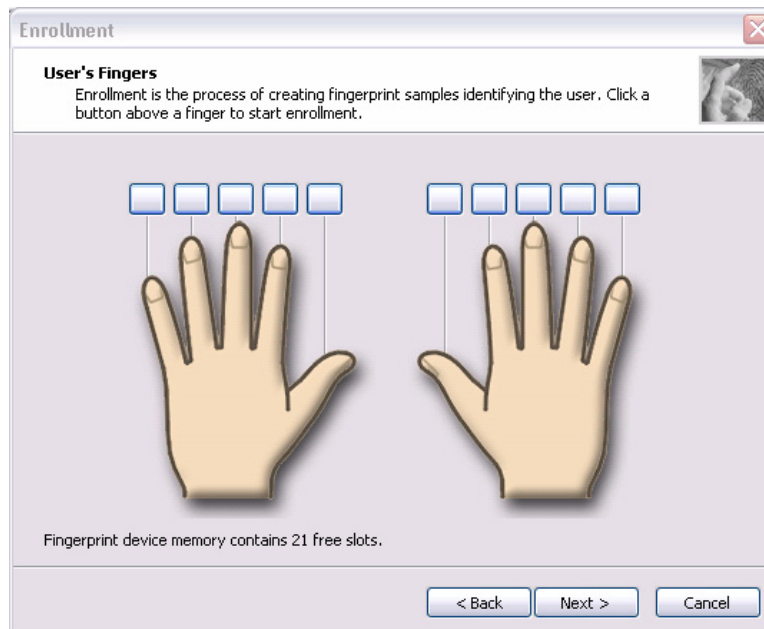


When you have failed in any time of four times reading and want to practice again, click [Try again]. When you have fully succeeded in four times of reading, the message of “Fully succeeded” appears.

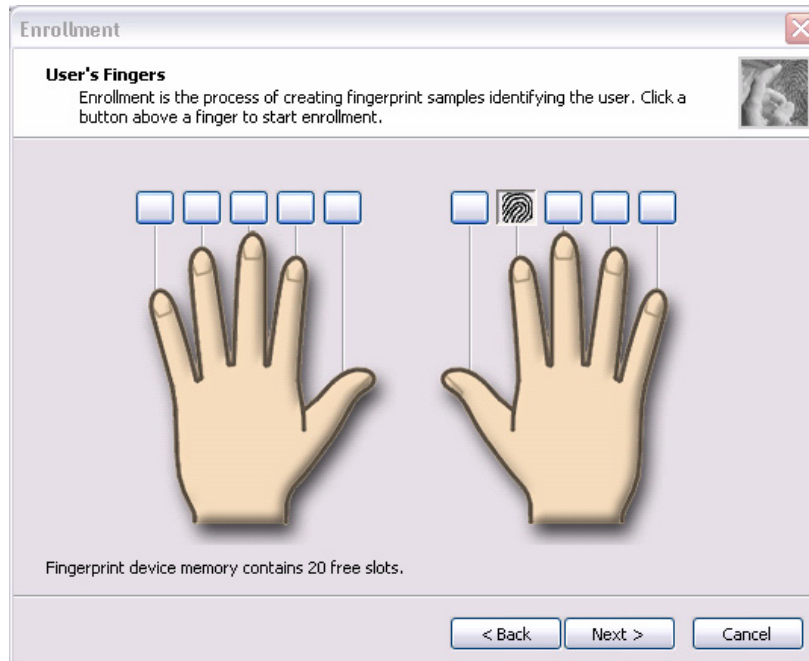


9. Click [Next]. The display of [User’s Fingers]

10. Click the box you want to enroll.



Put lightly the first joint of your finger you want to enroll on the fingerprint sensor and slide your finger sideways. Enroll your finger three times. Every time your finger has been successfully enrolled, one box is checked. When your finger has been successfully enrolled three times, the message of “Succeeded” appears.



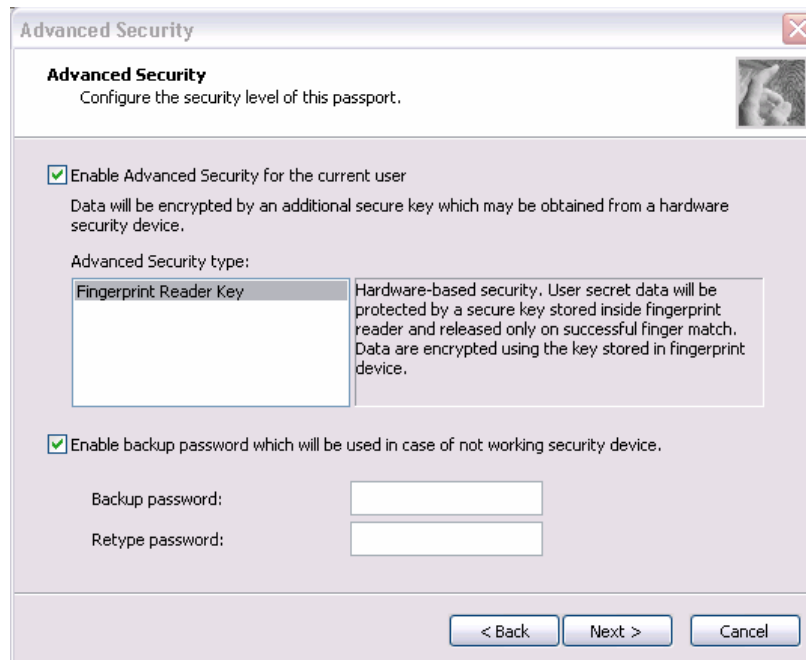
When you do not enroll your finger within two minutes after [User's Fingerprint] has been displayed, an error message appears. At the time, click [OK] and enroll your fingerprint.

When you attempt to enroll your finger that has been enrolled, you can not enroll. Enroll your other finger again.

10. Enroll another finger in Procedure 9. Enroll two fingers at least.
11. The display that recommend you to register a password.
12. Click [OK] in the following display.

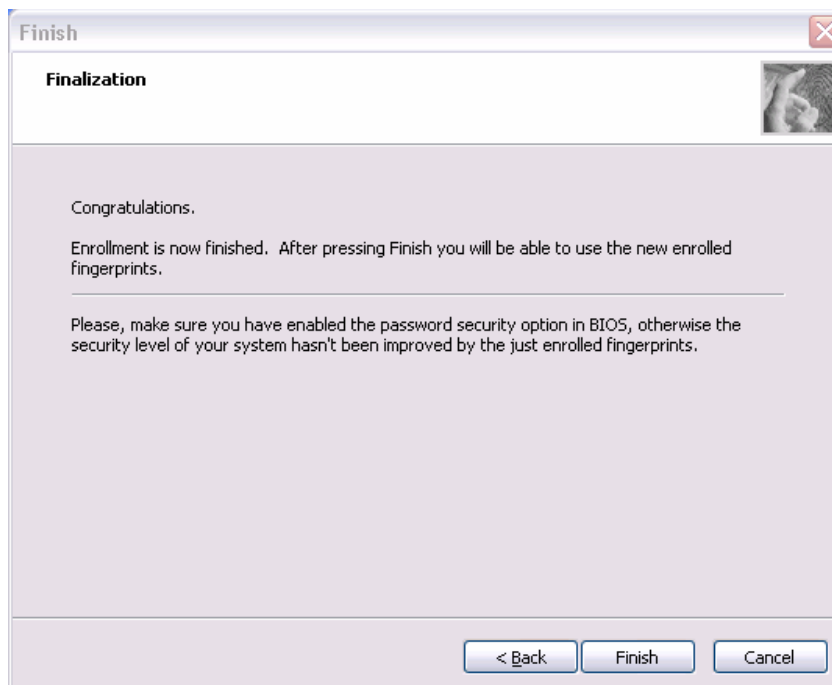


13. Type a backup password two times in the following display. (This password is different from the password of Windows logon.)



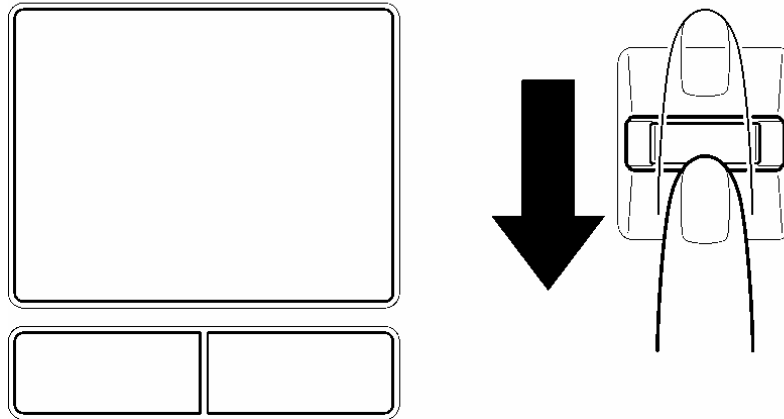
14. Click [Next]. The [Finish] display appears.

15. Click [Finish], “Welcome” display appears.



Procedure 3 Authentication of fingerprint

1. Turn on the computer to start up Windows.
2. In the Windows logon window, put lightly the first joint of your finger registered and slide your finger sideways.



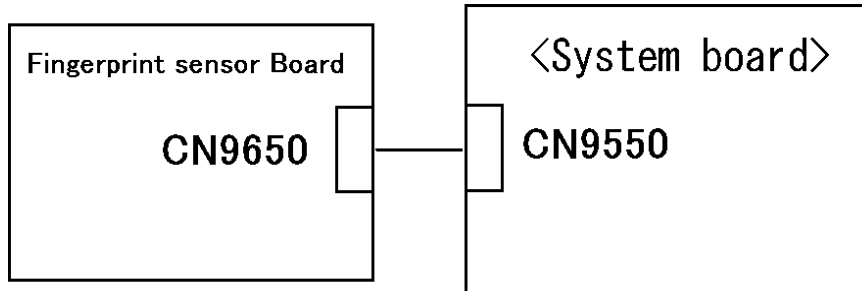
When authenticated, [Success] is displayed in the fingerprint authentication display.

When not authenticated well, warning message appears. If you fail continually ten times or more, you can not use the fingerprint authentication about one minute.

When not authenticated, type the password to logon to Windows.

Procedure 4 Connector Check and Replacement Check

The Fingerprint sensor cable is connected to the connector CN9650 on the Fingerprint sensor board and connector CN9550 on the system board.



- Check 1 Check the Fingerprint sensor cable is firmly connected to the connector CN9650 on the Fingerprint sensor board and connector CN9550 on the system board. If not, connect it firmly. If the Fingerprint sensor is still not functioning properly, perform Check 2.
- Check 2 The Fingerprint sensor cable may be faulty. Replace it with a new one. If the problem persists, perform Check 3.
- Check 3 The Fingerprint sensor board may be faulty. Replace it with a new one. If the problem persists, perform Check 4.
- Check 4 The system board may be faulty. Replace it with a new one.

Chapter 3

Tests and Diagnostics

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3.1 The Diagnostic Test

This chapter explains how to use the Diagnostic Test programs to test the functions of the computer's hardware modules. The Diagnostics Programs are stored on some Diagnostic Disks. There are Service Program Modules (DIAGNOSTIC MENU) and the Test Program Modules (DIAGNOSTIC TEST MENU) on the Diagnostic Disk.

The Hardware Initial information Setting Tool consists of some programs which write the hardware information or displays the current information of the computer. It is also included in one of Diagnostic Disks.

The heatrun test is automatic test program which executes the some tests successively.

NOTE: Before starting the diagnostics, be sure to follow these steps:

1. Check all cables are connected firmly.
2. Exit any application and close Windows.
3. Check if [All Devices] is selected in the "Device Config." in SETUP menu.

3.1.1 Diagnostics menu

The DIAGNOSTIC MENU consists of the following functions.

- DIAGNOSTIC TEST
- ONLY ONE TEST
- HEAD CLEANING
- LOG UTILITIES
- RUNNING TEST
- FDD UTILITIES
- SYSTEM CONFIGURATION
- POWER OFF

The DIAGNOSTIC TEST MENU contains the following functional tests:

- SYSTEM TEST
- MEMORY TEST
- KEYBOARD TEST
- DISPLAY TEST
- FLOPPY DISK TEST
- PRINTER TEST [It is not supported]
- ASYNC TEST
- HARD DISK TEST
- REAL TIMER TEST

- NDP TEST
- EXPANSION TEST
- CD-ROM/DVD-ROM TEST
- ERROR RETRY COUNT SET [FDD & HDD]

Other tests are:

- Wireless LAN TEST (Wireless LAN TEST disk)
- LAN/Modem/Bluetooth/IEEE1394 TEST (LAN/Modem/Bluetooth/IEEE1394 TEST disk)
- Sound TEST (Sound TEST disk)

You will need the following equipment to perform some of the Diagnostic test programs.

- The Diagnostic Disks (T&D for maintenance for Main, LAN/Modem/Bluetooth/IEEE1394, wireless LAN and Sound , 3G)
- A formatted working disk (Floppy disk test)
- USB FDD (for all tests)
- A USB test module (USB test)
- A USB cable (USB test)
- An external CRT monitor (Expansion test)
- A CD test media TOSHIBA CD-ROM TEST DISK or ABEX TEST CD-ROM (Sound test)
- A DVD test media (DVD-ROM TEST DISK TSD-1) (Sound test)
- A music CD (Sound test)
- A store-bought CD-RW media (CD-ROM/DVD-ROM test)
- A microphone (Sound test)
- Headphones (Sound test)
- A cleaning kit to clean the floppy disk drive heads (Head Cleaning)
- An exclusive modem test jig (Nitto Electric Manufacture Co.,Ltd-made QE2000P01) (Modem test)
- A module cable and RJ11 connector checker (Modem test)
- A LAN wraparound connector (LAN test)
- PC card wraparound connector (Expansion test)
- A display with monitor ID function (Expansion test)
- RS232C wraparound connector (Async test)
- A PC for wraparound test (Wireless LAN test/Bluetooth test/IEEE1394 test)

3.1.2 H/W (Hardware) initial information setting tool

The H/W initial information setting tool consists of the following programs.

- Initial configuration
- DMI information save
- DMI information recovery
- System configuration display
- E2PROM test (MAC/GUID/DMI)

You will need the following equipment to perform some of the programs.

- The Diagnostics Disk (Main T&D)

3.1.3 Heatrun test program

The heatrun test starts automatically after the selection.

You will need the following equipment to perform this program.

- The Diagnostics Disk (Main T&D)

3.2 Executing the Diagnostic Test

To start the DIAGNOSTIC PROGRAM, follow these steps:

1. Insert the Diagnostics disk in the USB floppy disk drive.
2. Turn on the computer while pressing **U** key. The following menu appears.

```
TOSHIBA Diagnostics Startup menu
```

```
-----  
1 Repair Main  
2 Repair Initial config set  
3 Repair Heatrun
```

```
Enter a chose...
```

To start the Diagnostics menu (T&D), press **1**, Repair Main and press **Enter**.

To start the H/W initial information setting tool, press **2**, Repair Initial config set and press **Enter**.

To start the Heatrun test, press **3**, Repair Heatrun and press **Enter**.

NOTE: When replacing the system board, it is necessary to execute the followings:

1. Before replacing, save the DMI information by executing subtest 03 DMI information save in 3.3 Setting of the hardware configuration.
2. Before replacing, apply the DMI information by executing subtest 04 DMI information recovery and subtest 08 System configuration in 3.3 Setting of the hardware configuration.

3.2.1 Diagnostics menu (T&D)

To execute this program, press **1** Repair Main and press **Enter** in the startup menu, press **Enter**. The following menu appears.

```
TOSHIBA personal computer XXXXXX DIAGNOSTICS
version X.XX (c) copyright TOSHIBA Corp. 20XX
```

```
DIAGNOSTICS MENU :

1 - DIAGNOSTIC TEST
2 - ONLY ONE TEST
3 -
4 - HEAD CLEANING
5 - LOG UTILITIES
6 - RUNNING TEST
7 - FDD UTILITIES
8 - SYSTEM CONFIGURATION
9 - POWER OFF
```

```
↑↓→← : Select items
Enter  : Specify
Esc    : Exit
```

NOTE: To exit the *DIAGNOSTIC TEST MENU*, press the **Esc** key. If a test program is in progress, press **Ctrl + Break** to exit the test program. If a test program is in progress, press **Ctrl + C** to stop the test program.

Set the highlight bar to **1**, and press **Enter**. The following DIAGNOSTIC TEST MENU will appear:

```
TOSHIBA personal computer XXXXXX DIAGNOSTICS
version X.XX (c) copyright TOSHIBA Corp. 20XX
```

```
DIAGNOSTIC TEST MENU :
```

```
1 - SYSTEM TEST
2 - MEMORY TEST
3 - KEYBOARD TEST
4 - DISPLAY TEST
5 - FLOPPY DISK TEST
6 - PRINTER TEST      [It is not supported]
7 - ASYNC TEST
8 - HARD DISK TEST
9 - REAL TIMER TEST
10 - NDP TEST
11 - EXPANSION TEST
12 - CD-ROM/DVD-ROM TEST
88 - ERROR RETRY COUNT SET [FDD & HDD]
99 - EXIT TO DIAGNOSTICS MENU
```

```
↑↓→← : Select items
Enter  : Specify
Esc    : Exit
```

Functions 1 through 12 are the Diagnostic Tests. Function 88 sets the floppy disk drive and hard disk drive error retry count (0-255).

To exit the submenu of the Diagnostic Test and returns to the Diagnostics Menu, set the highlight bar to function 99 and press **Enter**.

Select the option you want to execute and press **Enter**. When you select 1- SYSTEM TEST, the following message will appear:

```

SYSTEM TEST NAME      XXXXXX
                      xxxxxxxx DIAGNOSTIC TEST VX.XX
                      [Ctrl]+[Break]   : test end
                      [Ctrl]+[C]      : key stop

SUB-TEST      : XX
PASS COUNT   : XXXXX      ERROR COUNT   : XXXXX
WRITE DATA  : XX         READ DATA    : XX
ADDRESS     : XXXXXX STATUS : XXX

SUB-TEST MENU :
01 - ROM checksum
04 - Fan ON/OFF
05 - Geyserville
06 - Quick charge
07 - DMI read
99 - Exit to DIAGNOSTIC TEST MENU

                               ↑↓→← : Select items
                               Enter  : Specify
                               Esc    : Exit

```

NOTE: *The menu displayed by your computer may be slightly different from the one shown above.*

Select the desired subtest number from the subtest menu and press **Enter**. The following message will appear:

```

TEST LOOP   : YES (or NO)
ERROR STOP  : YES (or NO)

```

Use the right and left arrow keys to move the cursor to the desired option.

Selecting **YES** of TEST LOOP increases the pass counter by one, each time the test cycle ends and restarts the test cycle.

Selecting **NO** returns the process to the subtest menu after the test is complete.

Use the up and down arrow keys to move the cursor to “ERROR STOP”.

Use the right and left arrow keys to move the cursor to the desired option and press **Enter**.

Selecting **YES** of ERROR STOP stops the test program when an error is found and displays the operation guide on the right side of the display screen as shown below:

```

ERROR STATUS NAME      [[ HALT OPERATION ]]

                        1: Test end
                        2: Continue
                        3: Retry

```

These three selections have the following functions respectively:

1. Terminates the test program and exits to the subtest menu.
2. Continues the test.
3. Restarts the test from the error.

Selecting **NO** keeps the test running even if an error is found. When an error occurred, the error status is displayed and one error is added to the error counter.

Table 3-1 in section 3.5 describes the function of each test on the subtest. Table 3-2 in section 3.18 describes the error codes and error status names for each error.

Details of tests in DIAGNOSTIC TEST MENU are described on and after section 3.6. As for other service programs, refer to section 3.20 to 3.25

3.2.2 H/W initial information setting tool

After selecting this test, the following menu appears in the display.

```

#####
#####      H/W initial information setting tool      #####
#####
*      1 ..... Initial configuration      *
*      2 ..... DMI information save      *
*      3 ..... DMI information recovery   *
*      4 ..... System configuration display *
*      5 ..... E2PROM test (MAC/GUID/DMI) *
*****
... Press test number [1,2,3,4,5] ?

```

For more details on this test, refer to the section 3.3.

3.2.3 Heatrun test program

After selecting this test, the heatrun test starts executing the same subtest as 3.23 RUNNING TEST.

For more details on this test, refer to the section 3.4.

3.3 Setting of the hardware configuration

To execute this program, **2**, Repair Initial config set and press **Enter** in the startup menu, press **Enter** and follow the directions on the screen. The H/W initial information setting tool consists of four subtests. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 1 Initial configuration

This subtest executes the following items and shows their contents in the display. When an item ends normally, the program proceeds automatically to the next one. When an error is found, the program stops and waits for key input. (After solving the problem, the program executes the item again.)

- Setting of the CPU set table
- Setting of the micro code
- Setting of the EHSS
- Inputting and writing of DMI information

When the DMI information is displayed, the following messages appear in order. Input each information. (If you do not replace the PCB, the DMI information should not be changed.)

1. “Enter Model Name ?” is displayed. Input the computer’s model name and press **Enter**. (e.g. DynaBook)
2. “Enter Version Number ?” is displayed. Input the computer’s version number and press **Enter**. (e.g. PC18070C313S)
3. “Enter Serial Number ?” is displayed. Input the computer’s serial number and press **Enter**. (e.g. 12345678)
4. “Enter Model Number ?” is displayed. Input the computer’s sales model number and press **Enter**. (e.g. PP200-AAAAA)
5. “Enter Bundle Number ?” is displayed. Input the computer’s PCN/Bundle number and press **Enter**. (e.g. PMSREQ3Q34H/S0123456789)
6. “Write data OK (Y/N) ?” is displayed. To write the DMI information to the Flash ROM, press **Y**, and then **Enter**.

7. “Create DMIINFO TXT (Y/N) ?” is displayed. Press **Y**, then the DMI information (text data) is written to the Floppy disk, etc.

- Setting of the HWSC
- Setting of the UUID
- Display of the DMI information (including UUID)

After completion of the above settings, H/W configuration & DMI information are appeared in order. Check the contents and press **Enter**.

Subtest 2 DMI information save

This is one of tools to copy the DMI information to a new PCB after replacing.

This subtest saves all the DMI data in a floppy disk.

Subtest 3 DMI information recovery

This is one of tools to copy the DMI information to a new PCB after replacing.

This subtest writes all the DMI data in the floppy disk into the new PCB.

NOTE: Since the data of UUID is updated every time when this subtest, DMI information recovery, is done, the saved UUID data is not written.

Subtest 4 System configuration display

This subtest displays the information of the system configuration.

When the following message appears, confirm the contents and press **Enter**.

Press [Enter] key

For more details on the system configuration information, refer to “3.25 System configuration”.

Subtest 5 E2PROM test (MAC/GUID/DMI)

It checks whether the MAC address, GUID of IEEE1394 and DMI information are written.

3.4 Heatrun Test

To execute this program, press **3**, Repair Heatrun and press **Enter** in the startup menu, press **Enter**.

After selecting this test, the same subtests as 3.23 Running Test are executed successively.

For more details on the procedure and test content, refer to Running Test.

When the heatrun test ends normally, following message appears in the display.

```
*****  
HEATRAN NORMAL END  
*****  
Press any key to continue...
```

Press any key and return to the startup menu.

NOTE: *The test result (Errorlog.txt) is stored in the floppy disk. The result is displayed in the same format as Log Utilities. For more details of the format, refer to 3.22 Log Utilities.*

3.5 Subtest Names

Table 3-1 lists the subtest names for each test program in the DIAGNOSTIC TEST MENU.

Table 3-1 Subtest names (1/2)

| No. | Test Name | Subtest No. | Subtest Name |
|-----|-------------|-------------|-------------------------------|
| 1 | SYSTEM | 01 | ROM checksum |
| | | 02 | Fan ON/OFF |
| | | 03 | Geyserville |
| | | 04 | Quick charge |
| | | 05 | DMI read |
| 2 | MEMORY | 01 | Conventional memory |
| | | 02 | Protected Mode |
| | | 03 | Protected Mode (cache off) |
| | | 04 | Cache memory (on/off) |
| | | 05 | Stress |
| 3 | KEYBOARD | 01 | Pressed key code display |
| 4 | DISPLAY | 01 | VRAM read/write for VGA |
| | | 02 | Gradation for VGA |
| | | 03 | Gradation for LCD |
| | | 04 | Gradation & Mode test for VGA |
| | | 05 | All dot on/off for LCD |
| | | 06 | "H" pattern display |
| | | 07 | LCD Brightness |
| 5 | FLOPPY DISK | 01 | Sequential read |
| | | 02 | Sequential read/write |
| | | 03 | Random address/data |
| | | 04 | Write specified address |
| | | 05 | Read specified address |

Table 3-1 Subtest names (2/2)

| No. | Test Name | Subtest No. | Subtest Name |
|-----|-----------------------------------|-------------|-----------------------------------|
| 6 | PRINTER [It is not supported] | 01 | Ripple pattern |
| | | 02 | Function |
| | | 03 | Wraparound |
| 7 | ASYNC | 01 | FIR/SIR Point to point (send) |
| | | 02 | FIR/SIR Point to point (receive) |
| | | 03 | Wraparound (board) |
| 8 | HARD DISK | 01 | Sequential read |
| | | 02 | Address uniqueness |
| | | 03 | Random address/data |
| | | 04 | Cross talk & peak shift |
| | | 05 | Partial Read |
| | | 06 | Write specified address |
| | | 07 | Read specified address |
| | | 08 | Sequential write |
| | | 09 | W-R-C specified address |
| 9 | REAL TIMER | 01 | Real time |
| | | 02 | Backup memory |
| | | 03 | Real time carry |
| 10 | NDP | 01 | NDP |
| 11 | EXPANSION | 01 | PCMCIA wraparound [Not supported] |
| | | 02 | RGB monitor ID |
| 12 | CD-ROM /DVD-ROM | 01 | Sequential read |
| | | 02 | Read specified address |
| | | 03 | Random address/data |
| | | 04 | RW 1point W/R/C |

3.6 System Test

To execute the System Test, select **1** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 ROM checksum

This subtest executes a checksum test of the BIOS ROM (range: F0000h to FFFFFh, 64KB) on the System Board.

Subtest 02 Fan ON/OFF

The following message will appear.

```
Fan number select (1;FAN#1(CPU), 2;FAN#2(GPU)*1, 0; FAN#1&#2)?
```

To check the CPU fan, press **1** and **Enter**.

To check the GPU fan, press **2** and **Enter**.

To check both CPU fan and GPU fan, press **0** and **Enter**.

The following message will appear.

```
*** Test Fan Revolution 0000RPM start
```

Make sure the fan does not rotate, then press **Enter**.

The following message will appear.

```
*** Test Fan Revolution Low speed Start
```

Make sure the fan rotates at low speed, then press **Enter**.

The following message will appear.

```
*** Test Fan Revolution High speed Start
```

Make sure the fan rotates at high speed, then press **Enter**.

After a while, the fan rotating will stop.

*1 2;FAN#2 (GPU) is not supported in this model.

Subtest 03 Geyserville

If the CPU supports Geyserville (SpeedStep), this subtest checks that the CPU operating clock speed can be changed.

Subtest 04 Quick charge

This subtest checks the status for the quick charge.

Subtest 05 DMI read

This subtest displays the information in the Flash-ROM in the following format.

```
*** DMI Data Display Ver X.XX ***  
Model Name       : XXXXXXXXXXXXX  
Version Number  : XXXXXXXXXXXXX  
Serial Number   : XXXXXXXXX  
Model Number    : XXXXXX-XXXXX  
PCN/BND number  : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
UUID Number     : XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX  
Press [Enter] to EXIT
```

To exit this subtest and return to the SYSTEM test menu, press **Enter**.

3.7 Memory Test

To execute the Memory Test, select **2** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Conventional memory

This subtest writes a constant data to conventional memory (0 to 640 KB), then reads the new data and compares the result with the original data.

Subtest 02 Protected Mode

NOTE: The CONFIG.SYS file must be configured without expanded memory manager programs such as EMM386.EXE, EMM386.SYS or QEMM386.SYS. Also, the HIMEM.SYS must be deleted from the CONFIG.SYS file.

This subtest writes constant data and address data (from 1MB to maximum MB), and reads the new data and compares the result with the original data.

Subtest 03 Protected Mode (cache off)

This subtest executes the same way as the subtest 02 with the cache off.

Subtest 04 Cache memory (on/off)

To test the cache memory, a pass-through write-read comparison of '5Ah' data is run repeatedly to the test area ('7000': 'Program' size to '7000': '7FFF' (32 KB)) to check the hit-miss ratio (on/off status) for CPU cache memory. One test takes 3 seconds.

Number of misses < Number of hits → OK

Number of misses ≥ Number of hits → Fail

Subtest 05 Stress

Write/Read buffer (1 size = 1B30h) is prepared in the conventional memory. The data is made in the Write Buffer, the data in Write Buffer is written in the area of address of 1MB or after. The data is red in the Read Buffer and data is compared in area up to the maximum size.

Data: FFh, FFh, FFh, FFh, FFh, 00h, 00h, 00h, 00h,
FFh, FFh, FFh, 00h, FFh, 00h, 00h, FFh, 00h,
00h, FFh, FFh, FFh, FFh, 00h, 00h, 00h, AAh

3.8 Keyboard Test

To execute the Keyboard Test, select **3** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Pressed key code display

When a key is pressed, the scan code, character code, and key top name are displayed on the screen in the format shown below. The **Ins Lock**, **Caps Lock**, **Num Lock**, **Scroll Lock**, **Alt**, **Ctrl**, **Left Shift** and **Right Shift** keys are displayed in reverse screen mode when pressed. The scan codes, character codes, and key top names are shown in Appendix E.

```
KEYBOARD TEST  IN PROGRESS  302000
      Scan code      =
      Character code  =
      Keytop         =
Ins Lock  Caps Lock  Num Lock   Scroll Lock
Alt       Ctrl       Left Shift  Right Shift
PRESS [Enter] KEY
```

3.9 Display Test

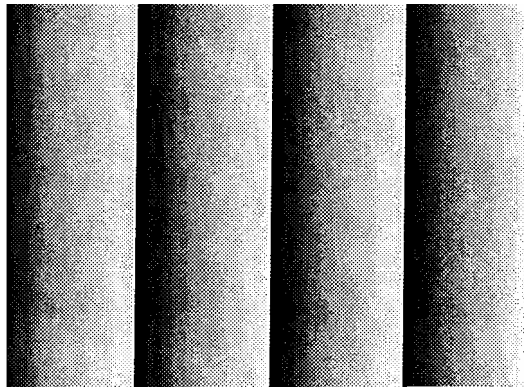
To execute the Display Test, select **4** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 VRAM read/write for VGA

This subtest writes the constant data (AAh and 55h) to the video RAM. The data is read and compared to the original data.

Subtest 02 Gradation for VGA

This subtest displays four colors: red, green, blue and white from left to right across the screen from black to maximum brightness. The display below appears on the screen, when this subtest is executed.



To exit this subtest and return to the DISPLAY TEST menu, press **Enter**.

Subtest 03 Gradation for LCD

This subtest displays bands of gradations for mixed colors, then for red, green, and blue. Next, it displays eight solid colors full screen: red, semi-red, green, semi-green, blue, semi-blue, white and semi-white. Each color displays for three seconds.

Subtest 04 Gradation & Mode test for VGA

This subtest displays gradations for following modes. To change the mode, press **Enter**.

```
[Mode 12]
[Mode 13]
[Mode 3]
[Mode 111  640*480  64K]
[Mode 112  640*480  16M]
[Mode 114  800*600  64K]
[Mode 115  800*600  16M]
[Mode 117 1024*768  64K]
[Mode 118 1024*768  16M]
```

The display below appears on the screen when this subtest is executed.



(Display example: Mode 12)

To exit this subtest and return to the DISPLAY TEST menu, press **Enter** after displaying the Mode 118.

Subtest 05 All dot on/off for LCD

This subtest displays an all-white screen then an all-black screen. The display changes automatically every three seconds and the screen returns to the DISPLAY TEST menu.

3.10 Floppy Disk Test

CAUTION: Before running the floppy disk test, prepare a formatted work disk. Remove the Diagnostics Disk and insert the work disk into the FDD because the contents of the floppy disk will be erased.

To execute the Floppy Disk Test, select **5** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions displayed on the screen.

1. The following message will appear. Select the media mode and start track to be tested and press **Enter**.

```
Test start track      (Enter:0/dd:00-79) ?
```

2. The Floppy Disk test contains five subtests that test the FDD. The floppy disk test menu will appear after you select FDD test parameters.

```
FLOPPY DISK          XXXXXXXX
```

```
XXX DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] : test end
[Ctrl]+[C]     : key stop
```

```
SUB-TEST      : XX
PASS COUNT    : XXXXX   ERROR COUNT   : XXXXX
WRITE DATA   : XX      READ DATA    : XX
ADDRESS       : XXXXXXX STATUS        : XXX
```

```
SUB-TEST MENU :
```

```
01 - Sequential read
02 - Sequential read/write
03 - Random address/data
04 - Write specified address
05 - Read specified address
99 - Exit to DIAGNOSTIC TEST MENU
```

```
↑↓→← : Select items
Enter : Specify
Esc   : Exit
```

Select the number of the subtest you want to execute and press **Enter**. The following message will appear during the floppy disk test.

```
FLOPPY DISK  IN PROGRESS  XXXXXXXX  xxx DIAGNOSTIC TEST VX.XX
                                         [Ctrl]+[Break] : test end
                                         [Ctrl]+[C]   : key stop
```

```
SUB-TEST      : XX
PASS COUNT    : XXXXX      ERROR COUNT   : XXXXX
WRITE DATA   : XX         READ DATA    : XX
ADDRESS      : XXXXXXXX STATUS : XXX
```

When the subtest 04 or 05 is selected, the following messages will appear on the screen. Select the test data (subtest 04 only), track number and head number you want to test.

```
Test data ?? (subtest 04 only)
Track No. ??
Head No.  ?
```

Subtest 01 Sequential read

This subtest performs a Cyclic Redundancy Check (CRC) that continuously reads all the tracks (track: 0 to 39/0 to 79) on a floppy disk.

Subtest 02 Sequential read/write

This subtest continuously writes data pattern B5ADADh to all the tracks (track: 0 to 39/0 to 79) on a floppy disk. The data is then read and compared to the original data.

Subtest 03 Random address/data

This subtest writes random data to random addresses on all tracks (track: 0 to 39/0 to 79) on a floppy disk. The data is then read and compared to the original data.

Subtest 04 Write specified address

This subtest writes the data specified by an operator to a specified track, head and address.

Subtest 05 Read specified address

This subtest reads data from a track, head and address specified by an operator.

3.11 Printer Test

NOTE: Printer Test is not supported for this model.

To execute the Printer Test, select **6** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen.

NOTE: An IBM compatible printer must be connected to the system to execute this test. Also, printer port wraparound connector must be connected.

The following message will appear, after selecting the subtest 01 to 03 of the printer test:

```
channel#1 = XXXXh
channel#2 = XXXXh
channel#3 = XXXXh
```

Select the channel number (1-3) ?

The printer I/O port address is specified by the XXXXh number. The computer supports three printer channels. Select the printer channel number, and press **Enter** to execute the selected subtest.

Subtest 01 Ripple pattern

This subtest prints characters for codes 20h through 7Eh line-by-line while shifting one character to the left at the beginning of each new line.

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnop
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnop
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnop
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqr
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrs
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrst
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstu
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuv
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvw
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxy
```

Subtest 02 Function

This subtest is for IBM compatible printers, and tests the following functions:

Normal print
 Double-width print
 Compressed print
 Emphasized print
 Double-strike print
 All characters print

This subtest prints the various print types shown below:

```

PRINTER TEST
1. THIS LINE SHOWS NORMAL PRINT.
2. THIS LINE SHOWS DOUBLE-WIDTH PRINT.
3. THIS LINE SHOWS COMPRESSED PRINT.
4. THIS LINE SHOWS EMPHASIZED PRINT.
5. THIS LINE SHOWS DOUBLE-STRIKE PRINT.
6. ALL CHARACTERS PRINT
   !"#$$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
   OPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
   stuvwxyz{|}~
  
```

Subtest 03 Wraparound

NOTE: To execute this subtest, a printer wraparound connector must be connected to the computer's printer port.

This subtest checks the output and bi-directional modes of the data control and status lines through the parallel port wraparound connector (34M741986G01). (Both output and bi-directional modes are tested.)

3.12 Async Test

To execute the Async Test, select **7** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions displayed on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 and 02 require the following data format:

Method : Asynchronous
Speed : 38400BPS
Data : 8 bits and one parity bit (EVEN)
Data pattern : 20h to 7Eh

Subtest 01 FIR/SIR point to point (send)

NOTE: To execute subtests 01 and 02, each computer must have access to the other computer's infrared port.

This subtest sends 20h through 7Eh data to the receive side, then receives the sent data and compares it to the original data through the FIR/SIR port.

Subtest 02 FIR/SIR point to point (receive)

This subtest is used with subtest 01 described above. This subtest receives the data from the send side, then sends the received data through the FIR/SIR port.

Subtest 03 Wraparound (board)

NOTE: To execute this subtest, a RS-232C wraparound connector must be connected to the RS-232C port.

This subtest checks the data send/receive function through the wraparound connector.

3.13 Hard Disk Test

To execute the Hard Disk Test, select **8** from the DIAGNOSTIC TEST MENU, press **Enter**, and follow the directions on the screen.

CAUTION: *The contents of the hard disk will be erased when subtest 02, 03, 04, 06, 08 or 09 is executed. Before running the test, the customer should transfer the contents of the hard disk to floppy disk or another hard disk. If the customer has not or can not perform the back-up, create back-up disks as described below.*

Check to see if the Microsoft Create System Disks Tools (MSCSD.EXE) still exists in the System Tools Folder. (This tool can be used only once.) If it exists, use it to back up the pre-installed software, then use the Backup utility in the System Tools folder to back up the entire disk, including the user's files.

Refer to the operating system instructions.

1. The following message appears for the error dump operation when a data compare error is detected. Select **1** or **2**.

Data compare error dump (1:no, 2:yes)

2. The following message appears for whether or not the HDC status is displayed on the screen. The HDC status is described in section 3.19. Select **1** or **2**.

Detail status display (1:no, 2:yes)

3. The Hard Disk Test message will appear after you respond to the Detail Status prompt. Select the number of the subtest you want to execute and press Enter. The following message will appear during each subtest.

```
HARD DISK TEST XXXXXXXX
```

```
XXX DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] : test end
[Ctrl]+[C]      : key stop
```

```
SUB TEST      : XX
PASS COUNT    : XXXXX      ERROR COUNT    : XXXXX
WRITE DATA   : XX         READ DATA   : XX
ADDRESS       : XXXXXXX    STATUS        : XXX
```

The first three digits of the ADDRESS indicate which cylinder is being tested, the fourth digit indicates the head number and the last two digits indicate the sector number.

The first digit of the STATUS indicates the drive being tested and the last two digits indicate the error status code as explained in the table 3-2 of the section 3.18.

Subtest 01 Sequential read

This subtest is a sequential reading of all the tracks on the HDD starting at track 0. When all the tracks on the HDD have been read, the test starts at the maximum track and reads the tracks on the HDD sequentially back to track 0.

Subtest 02 Address uniqueness

This subtest writes unique address data to each sector of the HDD track-by-track. The data written to each sector is then read and compared with the original data. There are three ways the HDD can be read:

1. Forward sequential
2. Reverse sequential
3. Random

Subtest 03 Random address/data

This subtest writes random data in a random length to random addresses. This data is then read and compared to the original data.

Subtest 04 Cross talk & peak shift

This subtest writes eight types of worst pattern data (listed below) to a cylinder and then reads the data while moving from cylinder to cylinder. (Tests the data interference in the neighbor track.)

| Worst pattern data | Cylinder |
|---------------------------|-----------------|
| 'B5ADAD' | 0 cylinder |
| '4A5252' | 1 cylinder |
| 'EB6DB6' | 2 cylinder |
| '149749' | 3 cylinder |
| '63B63B' | 4 cylinder |
| '9C49C4' | 5 cylinder |
| '2DB6DB' | 6 cylinder |
| 'D24974' | 7 cylinder |

Subtest 05 Partial Read

This subtest reads 1GB data which is in minimum, middle and maximum address of the HDD area.

Subtest 06 Write specified address

This subtest writes specified data to a specified cylinder and head on the HDD.

Subtest 07 Read specified address

This subtest reads data, which has been written to a specified cylinder and head on the HDD.

Subtest 08 Sequential write

This subtest writes specified 2-byte data to all of the cylinders on the HDD.

Subtest 09 W-R-C specified address

This subtest writes data to a specified cylinder and head on the HDD, then reads the data and compares it to the original data.

3.14 Real Timer Test

To execute the Real Timer Test, select **9** from the DIAGNOSTIC TEST MENU, press **Enter** and follow the directions on the screen. Move the highlight bar to the subtest you want to execute and press **Enter**.

Subtest 01 Real time

A new date and time can be input during this subtest. To execute the real time subtest, follow these steps:

1. Select subtest 01 and the following messages will appear:

```
Current date : XX-XX-XXXX
Current time : XX:XX:XX
Enter new date:

PRESS [ENTER] KEY TO EXIT TEST
```

2. If the current date is not correct, input the correct date at the “Enter new date” prompt and press **Enter**.

3. The following messages will appear:

```
Current date : XX-XX-XXXX
Current time : XX:XX:XX
Enter new time:

PRESS [ENTER] KEY TO EXIT TEST
```

4. If the current time is not correct, input the correct time in 24-hour format. To enter “:”, press **Shift + ;**. The time is updated.

To exit the test, press **Enter**.

Subtest 02 Backup memory

This subtest checks the following backup memories:

Writes 1-bit of “on” data (01h through 80h) to address 0Eh through 7Fh

Writes 1-bit of “off” data (FEh through 7Fh) to address 0Eh through 7Fh

Writes the data pattern AAh and 55h to the address 0Eh to 7Fh

Then the subtest reads and compares this data with the original data.

Subtest 03 Real time carry

| |
|---|
| CAUTION: <i>When this subtest is executed, the current date and time are erased.</i> |
|---|

This subtest checks the real time clock increments, making sure the date and time are displayed in the following format:

```
Current date  : 12-31-1999
Current time  : 23:59:58
```

The real time increments are automatically executed and the following is displayed:

```
Current date  : 01-01-2000
Current time  : 00:00:00
```

```
PRESS [Enter] KEY TO EXIT TEST
```

To exit the test, press **Enter**.

3.15 NDP Test

To execute the NDP test, select **10** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

Subtest 01 NDP

This test checks the following functions of NDP:

- Control word
- Status word
- Bus
- Addition
- Multiplication

3.16 Expansion Test

To execute the expansion test, select **11** from the DIAGNOSTICS TEST MENU, press **Enter** and follow the directions on the screen.

Subtest 01 PCMCIA wrap around [It is not supported]

CAUTION: PCMCIA wraparound test is not supported for this model.

NOTE: To execute this subtest, the PC card wraparound connector is required.

This subtest checks the following signal line of the PC card slot:

- Address line
- REG#, CE#1, CE#2 line
- Data line
- Speaker line
- Wait line
- BSY#, BVD1 line

This subtest is executed in the following order:

| Sub# | Address | Good | Bad | Contents |
|------|----------------|----------|----------|---|
| 01 | 00001 00001 | nn nn | xx xx | Address line REG#, CE#1, CE#2 nn=A0, 90, 80, 00 |
| 02 | 00002 | ww | rr | Data line ww=write data, rr=read data |
| 03 | 00003 | — | — | Speaker line |
| 04 | 00004 | 40,80 | xx | Wait line (40<xx<80) |
| 05 | 00005 | nn | xx | Other lines (BSY#, BVD1) NN=21, 00 |

NOTE: Select the subtest number 01, The following message will appear:
Test slot number select (1:slot0, 2:slot1, 0:slot0&1)?

Subtest 02 RGB monitor ID

NOTE: To execute this subtest, an external monitor with monitor ID function is required.

Connect the external monitor to the PC for the test of ID acquisition.

The judgment of acquisition is based on the panel data. In simultaneous display mode or internal display mode, in which the panel data is acquired, this subtest will fail. Therefore, make sure only the external display is selected when executing this subtest.

3.17 CD-ROM/DVD-ROM Test

NOTE: For the subtest 01, 02 and 03, use the TOSHIBA CD-ROM TEST DISK TDY-01 or ABEX TEST CD-ROM TCDR-702 and DVD-ROM TEST DISK TSD-1. For the subtest 04, use a CD-RW on the market.

Subtest 01 Sequential read

This subtest is a sequential reading of one-block units (2K bytes) of all the logical addresses.

Subtest 02 Read specified address

This subtest reads one-block data from a specified address.

Subtest 03 Random address/data

This subtest reads one-block data and multi-block data from random addresses 200 times.

Subtest 04 RW 1point W/R/C

This subtest writes, reads and compares data at one point on a CD/RW media.

3.18 Error Code and Error Status Names

Table 3-2 lists the error codes and error status names for the DIAGNOSTIC TEST.

Table 3-2 Error codes and error status names (1/3)

| Device name | Error code | Error status name |
|-------------|--|---|
| (Common) | FF | Data Compare Error |
| System | 01 03 04 05 06 07 08 09 10 | ROM - CHECKSUM ERROR ROM - SERIAL ID WRITE ERROR ROM - NOT SUPPORTED PS-SYSTEM ROM - SENSING ERROR(AC-ADAPT) ROM - SENSING ERROR(1st Batt) ROM - SENSING ERROR(2nd Batt) ROM - THORMISTOR ERROR(1) ROM - THORMISTOR ERROR(2) ROM - THORMISTOR ERROR(3) |
| Memory | 01 02 DD | RAM - PARITY ERROR RAM - PROTECTED MODE NO CHANGE' RAM - CACHE MEMORY ERROR |
| Keyboard | FE FD F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 FA EF ED | USB - GET DESCR.ERROR (FIRST) USB - SET ADDRESS ERROR HUB - GET DESCR.ERROR(Top 8B) HUB - GET DESCR.ERROR (Whole) HUB - SET CONFIGURATION ERROR HUB - GET DESCR.ERROR(DESCR.) HUB - SET FEATURE ERROR(P ON) HUB - GET STATUS ERROR HUB - SET FEATURE ERROR(RESET) HUB - CLEAR FEATURE ERROR HUB - CLEAR FEATURE1 ERROR HUB - SET FEATURE ERROR(Enab.) HUB - CLEAR FEATURE2 ERROR USB - OVER CURRENT ERROR USB - GET DESCR.ERROR(SECOND) |
| Display | EE | VRAM SIZE NOT SUPPORT |

Table 3-2 Error codes and error status names (2/3)

| Device name | Error code | Error status name |
|-------------|--|---|
| FDD | 01 02 03 04 08 09 10 20 40 80 60 06 EE | FDD - BAD COMMAND ERROR FDD - ADDRESS MARK NOT FOUND FDD - WRITE PROTECTED FDD - RECORD NOT FOUND FDD - DMA OVERRUN ERROR FDD - DMA BOUNDARY ERROR FDD - CRC ERROR FDD - FDC ERROR FDD - SEEK ERROR FDD - TIME OUT ERROR FDD - NOT DRIVE ERROR FDD - MEDIA REMOVED FDD - WRITE BUFFER ERROR |
| Printer | 01 08 10 20 40 80 | PRT - TIME OUT PRT - FAULT PRT - SELECT LINE PRT - OUT OF PAPER PRT - POWER OFF PRT - BUSY LINE |
| ASYNC | 01 02 04 08 10 20 40 80 88 05 06 | RS232C - [DTR ON] TIME OUT RS232C - [CTS ON] TIME OUT RS232C - [RX READY] TIME OUT RS232C - [TX FULL] TIME OUT RS232C - PARITY ERROR RS232C - FRAMING ERROR RS232C - OVERRUN ERROR RS232C - LINE STATUS ERROR RS232C - MODEM STATUS ERROR SIR - TIME OUT ERROR FIR - TIME OUT ERROR |
| HDD | 05 07 09 0B BB 08 01 02 04 10 20 40 80 11 AA | HDD - HDC NOT RESET ERROR HDD - DRIVE NOT INITIALIZE HDD - DMA BOUNDARY ERROR HDD - BAD TRACK ERROR HDD - UNDEFINED ERROR HDD - OVERRUN ERROR (DRQ ON) HDD - BAD COMMAND ERROR HDD - ADDRESS MARK NOT FOUND HDD - RECORD NOT FOUND ERROR HDD - ECC ERROR HDD - HDC ERROR HDD - SEEK ERROR HDD - TIME OUT ERROR HDD - ECC RECOVER ENABLE HDD - DRIVE NOT READY |

Table 3-2 Error codes and error status names (3/3)

| Device name | Error code | Error status name |
|--------------------|--|---|
| (HDD) | CC E0 0A EE DA 12 | HDD - WRITE FAULT HDD - STATUS ERROR HDD - BAD SECTOR HDD - ACCESS TIME ERROR HDD - NO HDD HDD - DMA CRC ERROR |
| NDP | 01 02 03 04 05 06 | NDP - NO CO-PROCESSOR NDP - CONTROL WORD ERROR NDP - STATUS WORD ERROR NDP - BUS ERROR NDP - ADDITION ERROR NDP - MULTIPLAY ERROR |
| EXPANSION | C1 C3 C4 C5 C6 C7 C8 CB CC CE CF | ADDRESS LINE ERROR CE#1 LINE ERROR CE#2 LINE ERROR DATA LINE ERROR WAIT LINE ERROR BSY# LINE ERROR BVD1 LINE ERROR ZV-Port ERROR NO PCMCIA CARD TYPE ERROR ZV_CONT# ERROR |
| CD-ROM /DVD-ROM | 01 02 03 04 05 06 09 11 20 40 80 90 B0 | BAD COMMAND ILLEGAL LENGTH UNIT ATTENTION MEDIA CHANGE REQUEST MEDIA DETECTED ADDITIMAL SENSE BOUNDARY ERROR CORRECTED DATA ERROR DRIVE NOT READY SEEK ERROR TIME OUT RESET ERROR ADDRESS ERROR |

3.19 Hard Disk Test Detail Status

When an error occurs in the hard disk test, the following message is displayed:

```
HDC status = XXXXXXXX
```

Detailed information about the hard disk test error is displayed on the screen by an eight-digit number. The first four digits represent the hard disk controller (HDC) error status number and the last four digits are not used.

The hard disk controller error status is composed of two bytes; the first byte displays the contents of the HDC status register in hexadecimal form and the second byte displays the HDC error register.

The contents of the HDC status register and error register are listed in Tables 3-3 and 3-4.

Table 3-3 Hard disk controller status register contents

| Bit | Name | Description |
|-----|------------------------------|--|
| 7 | BSY (Busy) | "0" ... HDC is ready. "1" ... HDC is busy. |
| 6 | DRY (Drive ready) | "0" ... Hard disk drive is not ready to accept any command. "1" ... Hard disk drive is ready. |
| 5 | DWF (Drive write fault) | "0" ... DWF error is not detected. "1" ... Write fault condition occurred. |
| 4 | DSC (Drive seek complete) | "0" ... The hard disk drive heads are not settled over a track. "1" ... The hard disk drive heads are settled over a track. |
| 3 | DRQ (Data request) | "0" ... Drive is not ready for data transfer. "1" ... Drive is ready for data transfer. |
| 2 | COR (Corrected data) | "0" ... Not used "1" ... Correctable data error is corrected. |
| 1 | IDX (Index) | "0" ... Not used "1" ... Index is sensed. |
| 0 | ERR (Error) | "0" ... Normal "1" ... The previous command was terminated with an error. |

Table 3-4 Error register contents

| Bit | Name | Description |
|-----|-------------------------|---|
| 7 | BBK (Bad block mark) | "0" ... Not used. "1" ... A bad block mark is detected. |
| 6 | UNC (Uncorrectable) | "0" ... There is no uncorrectable data error. "1" ... Uncorrectable data error has been detected. |
| 5 | — | Not used. |
| 4 | IDN (Identification) | "0" ... Not used. "1" ... There is no ID field in the requested sector. |
| 3 | — | Not used |
| 2 | ABT (Abort) | "0" ... Not used. "1" ... Illegal command error or command abort. |
| 1 | TK0 (Track 0) | "0" ... The hard disk found track 0 during a recalibrate command. "1" ... The hard disk could not find track 0 during a recalibrate command. |
| 0 | — | Not used. |

3.20 ONLY ONE TEST

3.20.1 Program Description

This program tests the unique functions of this model.

3.20.2 Operations

Select test **2** from the DIAGNOSTIC MENU and press **Enter**. The following menu appears in the display.

```
#####
#####          ONLY ONE TEST Menu (XXXXXXXX)          #####
#####
*
*  1 ..... Pressed Key Display                          *
*  2 ..... Touch Pad /   IPS                             *
*  3 ..... Wireless communication switch                 *
*  4 ..... USB                                           *
*  5 ..... LED                                           *
*  6 ..... Button                                        *
*  7 ..... Acceleration sensor                          *
*  8 ..... Docker Dock/Undoc                            *
*  9 ..... Exit to Common Test                          *
*
*****
.... Press test number [1-A] ?
```

Select the subtest number you want to test and press **Enter**.

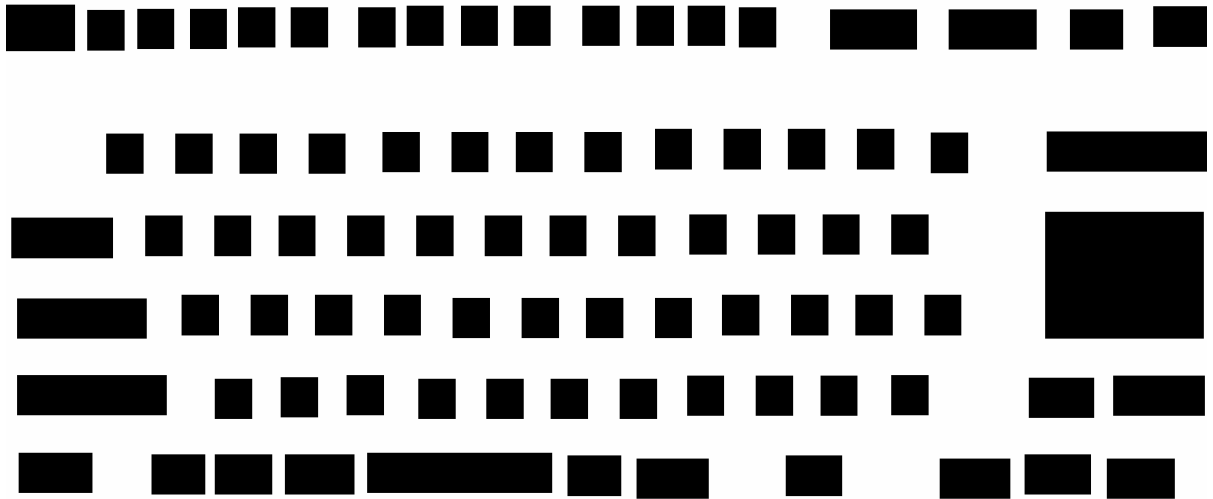
To return to the Common Test menu, select **9** and press **Enter**.

Subtest 1 Pressed key display

When you execute this subtest, the keyboard layout is drawn on the display as shown below. When any key is pressed, the corresponding key on the screen changes to the key character that was pressed. Holding a key down enables the auto-repeat function that causes the key's display character to blink.

Press **Del + Enter** to end the test.

<<<<<< Press Key Display >>>>>>



IF TEST OK, Press [Del] [Enter] Key

NOTE: The actual display may be different from the above image, according to the model.

Subtest 2 Touch Pad

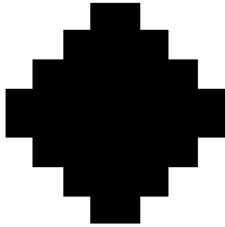
This subtest checks the functions of the touch pad as shown below.

- A) Direction and parameter
- B) Switching function check.

This test displays the response from the touch pad and touch pad switch. When moving your finger on the touch pad towards the upper left, the <POINTING> display changes according to the following illustration. If a touch pad switch is pressed, the <BUTTONS> displays appear on the right side one by one. The parameters appear above the <BUTTONS> (1) or (2) corresponding to the pressed touch pad switch highlights. To end this subtest, press two touch pad switches at the same time.

*** IPS TEST PROGRAM (Vx.xx) ***

<POINTING>



<PARAMETER>

STATUS:0000h

X-RATE:0000h

Y-RATE:0000H

<BUTTON>

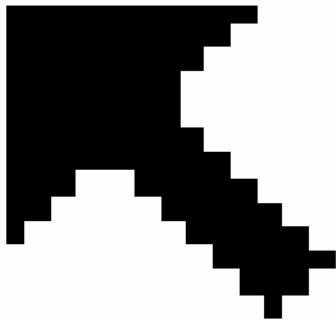
(1) (2)



<< PRESS BUTTON1+BUTTON2 THEN END >>

*** IPS TEST PROGRAM (Vx.xx) .***

< POINTING >



<PARAMETER>

STATUS:0018h

X-RATE:OK

Y-RATE:OK

<BUTTON>

(1) (2)



<< PRESS BUTTON1+BUTTON2 THEN END >>

Subtest 3 Wireless communication switch

This subtest checks if the Wireless communication switch works properly. If the test is started with the switch ON, following message appears in the display.

```
Wireless communication switch is set to a start position (OFF)
```

Slide the switch to OFF position. Then, following message appears in the display.

```
Wireless communication switch ON !!
```

Slide the switch to ON position. Then, following message appears in the display.

```
Wireless communication switch OFF !!
```

After Sliding the switch to OFF position, return to the ONLY ONE TEST menu automatically.

Subtest 4 USB

NOTE: When executing this subtest, USB test module and USB cable must be connected.

This subtest checks if USB port works properly.

The following menu appears in the display.

```
#####
#####          USB Port Select      (PORTEGE R)          #####
#####
*
*  0 .....      Port 0 (right side front)                *
*  1 .....      Port 1 (right side back)                  *
*  2 .....      Port 2 (Left side)                        *
*  9             Exit                                     *
*
*****
.... Press test number[0-2, 9] ?
```

Connect the USB test module and USB cable to the computer.

Input the port test number and press **Enter**.

OK message appears in the display if the test ends without fail.

NG message appears in the display if an error is found during the test.

Confirm the connection of cable, and then execute the test again.

Press **9** and **Enter** to return to ONLY ONE TEST menu.

Press the Toshiba Presentation button after the following message appears.

| | | | |
|-------|---|---|----|
| Step2 | X | 1 | 2 |
| | * | * | ⓧ. |

Press Function button (Presentation button)

OK message appears in the display if the test ends without an error.

Press any key return to each Steps if **NG!** or **Press any key** message appears.

If the test ends successfully, the display returns to the ONLY ONE TEST menu.

Subtest 7 Acceleration sensor

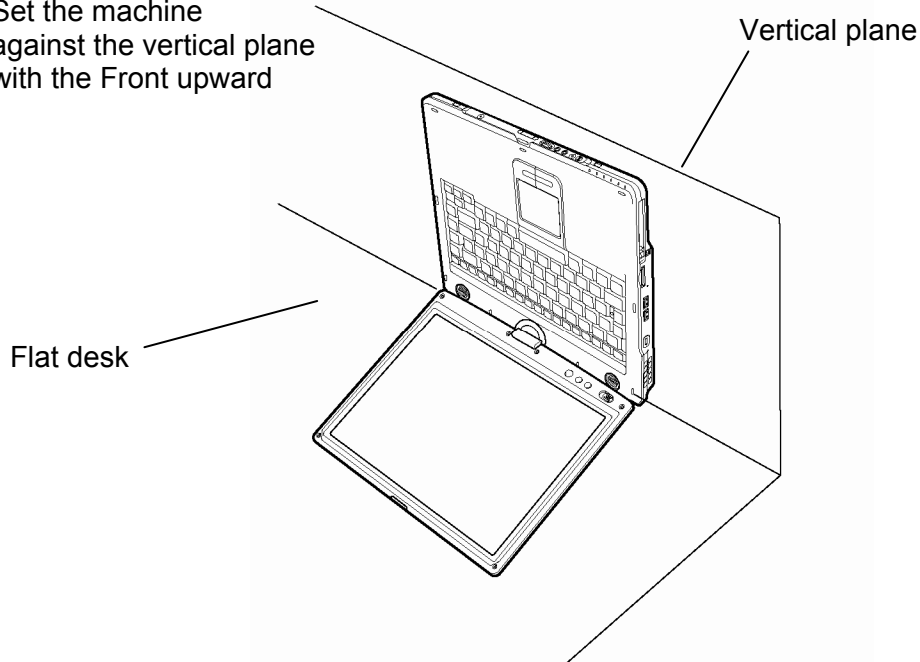
This subtest detects and corrects the each axis (X, Y, Z).

NOTE: Make sure that this subtest is executed on the following condition:

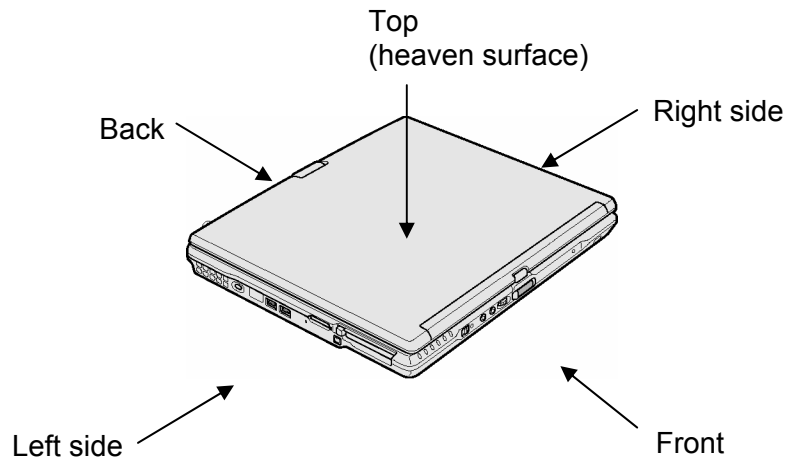
1. Flat desk with vertical plane to get the stability of machine.
2. The vertical wall or plane is necessary.
3. Prevent the machine from shake or shock.

<Example>

Set the machine against the vertical plane with the Front upward



The figure below shows the name and position of each side.



When this subtest is selected, the following message appears in the display.

```
The heaven surface establishes in the upper direction
Press [Enter] key
```

NOTE: Be sure to execute the test with the display panel opened.

Set the machine on the flat desk. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

```
The back establishes in the upper direction
Press [Enter] key
```

Set the machine against the vertical plane on the flat desk with the back of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

```
The right establishes in the upper direction
Press [Enter] key
```

Set the machine against the vertical plane on the flat desk with the right side of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

```
The front establishes in the upper direction
Press [Enter] key
```

Set the machine against the vertical plane on the flat desk with the front of machine upward. Then press **Enter** to detect the data on this setting of machine. The following message appears in the display.

```
The left establishes in the upper direction
Press [Enter] key
```

Set the machine against the vertical plane on the flat desk with the left side of machine upward. Then press **Enter** to detect the data on this setting of machine.

When there is no defective during the all checks above, the following message appears in the display. Then press **Enter** and return to the Only One Test menu.

```
** Setting OK! **  
Press [Enter] key
```

When any trouble in the above setting is found, the following message appears and the test halts. Then press **Enter** and return to the Only One Test menu.

```
** Setting ERROR! **  
Press [Enter] key
```

Subtest 8 Docker Dock/Undock

This subtest is executed with an Express Port Replicator installed.

Press **Enter** while pushing the eject button of the Express Port Replicator after the following message appears.

```
Slide Eject-SW, and press [Enter] Key
```

Press **Enter** without pushing the eject button of the Express Port Replicator after the following message appears.

```
Release Eject-SW, and press [Enter] Key
```

If the test ends successfully, the display returns to the ONLY ONE TEST menu.

When the display returns to the ONLY ONE TEST menu, remove the Express Port Replicator from the computer.

3.21 Head Cleaning

3.21.1 Function Description

This function cleans the heads in the FDD by executing a series of head load/seek and read operations. A cleaning kit is necessary to perform this program.

3.21.2 Operations

1. Selecting test **4** from the DIAGNOSTIC MENU and pressing **Enter** displays the following messages:

```
DIAGNOSTICS - FLOPPY DISK HEAD CLEANING : VX.XX
Mount cleaning disk(s) on drive(s) .
Press any key when ready.
```

2. Remove the Diagnostics Disk from the FDD, then insert the cleaning disk and press **Enter**.
3. When the “cleaning start” message appears, the FDD head cleaning has begun.
4. The display automatically returns to the DIAGNOSTIC MENU when the program is completed.

3.22 Log Utilities

3.22.1 Function Description

This function logs error information generated while a test is in progress and stores the results in RAM. This function can store data on a floppy disk, or output the data to a printer or the display.

The error information is displayed in the following order:

1. Error count (CNT)
2. Test name, Subtest number (TS-No)
3. Pass count (PASS)
4. Error status (STS)
5. FDD/HDD or memory address (ADDR)
6. Write data (WD)
7. Read data (RD)
8. HDC status (HSTS)
9. Error status name (ERROR STATUS NAME)

If the power switch is turned off, the error information will be lost.

3.23 Running Test

3.23.1 Function Description

This function automatically executes the following tests in sequence:

1. System test (subtest 01)
2. Memory test (subtests 01, 02)
3. Display test (subtest 01)
4. Real timer test (subtest 02)
5. HDD test (subtest 01)
6. FDD test (subtest 02)

The system automatically detects the number of floppy disk drives connected to the computer for the FDD test.

3.23.2 Operations

***NOTE:** After booting up the Running test, pull out the test program and insert a floppy disk which has been formatted by **FORMAT** command of DOS.*

1. Pull out the test program and insert a floppy disk which has been formatted by **FORMAT** command of DOS.
2. Select **6** from the DIAGNOSTIC MENU and press **Enter**, the following messages for selectable tests will appear in the display in order.

```
FDD write/read test (Y/N) ?  
Printer wrap around test (Y/N) ?  
Serial wrap around test (Y/N) ?  
CD-ROM/DVD-ROM read test (Y/N) ?
```

3. To execute the test, press **Y** and **Enter**. To cancel the test, press **N** and **Enter**. If you select the selectable tests, follow the instruction message in the display.
4. After selecting the selectable tests, the running test starts automatically. To terminate the program, press **Ctrl + Break**.

3.24 Floppy Disk Drive Utilities

3.24.1 Function Description

This function formats the FDD, copies the floppy disk and displays the dump list for both the FDD and HDD.

1. FORMAT

NOTE: *This program is only for testing a floppy disk drive. It is different from the Toshiba DOS FORMAT command.*

This program can format a floppy disk in the following formats:

- (a) 2DD: Double-sided, double-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 9 sectors/track.
- (b) 2HD: Double-sided, high-density, double-track, 96/135 TPI, MFM mode, 512 bytes, 18 sectors/track.

2. COPY

This program copies data from a source floppy disk to a target floppy disk.

3. DUMP

This program displays the contents of the floppy disk and the designated sectors of the hard disk on the display.

4. HDD ID READ

This program reads the hard disk ID and displays hard disk information.

3.24.2 Operations

1. Selecting **7** from the DIAGNOSTIC MENU and pressing **Enter** displays the following message.

```
[ FDD UTILITIES ]

1 - FORMAT
2 - COPY
3 - DUMP
4 - HDD-ID READ
9 - EXIT TO DIAGNOSTICS MENU
```

2. FORMAT program

- (a) Selecting FORMAT displays the following message.

```
DIAGNOSTICS - FLOPPY DISK FORMAT : VX.XX
Drive number select (1:A, 2:B) ?
```

- (b) Select a drive number to display the following message.

```
Type select (0:2DD, 3:2HD) ?
```

- (c) Select a media/drive type number and press **Enter**. A message similar to the one below will be displayed.

```
Warning : Disk data will be destroyed.
Insert work disk into drive A:
Press any key when ready.
```

- (d) Remove the Diagnostics Disk from the FDD, insert the work disk and press any key.

The following message will be displayed when the FDD format is executed.

```
[ FDD TYPE ] : TRACK  = XXX
[ FDD TYPE ] : HEAD   = X
[ FDD TYPE ] : SECTOR = XX

Format start

[[track, head = XXX X]]
```

After the floppy disk is formatted, the following message will appear.

```
Format complete
Another format (1:Yes/2:No) ?
```

- (e) Typing **1** displays the message from step (c) above. Typing **2** returns the test to the DIAGNOSTIC MENU.

3. COPY program

- (a) When COPY is selected, the following message appears.

```
FLOPPY DISK FORMAT & COPY : VX.XX
Type select (0:2DD,3:2HD) ?
```

- (b) Selecting a media/drive type number will display a message similar to the one below.

```
Insert source disk into drive A:
Press any key when ready.
```

- (c) Remove the Diagnostics Disk from the FDD, insert the source disk and press any key. The following message will appear, indicating the program has started.

```
[ FDD TYPE ] : TRACK      = XXX
[ FDD TYPE ] : HEAD       = X
[ FDD TYPE ] : SECTOR     = XX

Copy start
                [[ track,head = XXX X ]]
```

- (d) The following message will appear.

```
Insert target disk into drive A:
Press any key when ready.
```

- (e) Remove the source disk from the FDD, then insert a formatted work disk and press any key. The following message will appear and start copying to the target disk.

```
                [[ track,head = XXX X ]]
```

- (f) When the amount of data is too large to be copied in one operation, the message from step (b) is displayed again. After the floppy disk has been copied, the following message will appear.

```
Copy complete
Another copy (1:Yes/2:No) ?
```

- (g) To copy another disk, type
- 1**
- and the message from step (a) is displayed again. Entering
- 2**
- returns the test program to the DIAGNOSTIC MENU.

4. DUMP program

- (a) When DUMP is selected, the following message appears.

```
DIAGNOSTICS-HARD DISK & FLOPPY DISK DUMP : VX.XX
Drive type select (1:FDD, 2:HDD) ?
```

- (b) Select a drive type. If 2:HDD is selected, the display will go to step (h). If 1:FDD is selected, the following message will appear.

```
Select drive number (1:A, 2:B) ?
```

- (c) Select a drive number and the following message will be displayed.

```
Format type select (1:2DD, 3:2HD) ?
```

- (d) If 3:2HD is selected, the following message will appear. Select a media mode.

```
2HD media mode (1:1.20MB, 2:1.44MB, 3:1.23MB) ?
```

- (e) The following message will appear.

```
Insert source disk into drive A:
Press any key when ready.
```

- (f) Insert a source disk and press any key and the following message will appear.

```
— Max. address —
[Track ] = XXXX
[Head  ] = XX
[Sector] = XX
Track number ????
```

- (g) Set the track number, head number and sector number you want to dump. The system will access the disk and dump a list. Then the message shown in (k) will appear.

- (h) The following message will appear when selecting 2:HDD in (a).

```
Select drive number (1:C, 2:D) ?
```

- (i) Select a drive number and the following message will be displayed.

```
---Max. address ---
[LBA ] = XXXXXXXXXXXX
LBA number ??????????
```

- (j) Set the LBA number you want to dump. The system will access the disk and dump a list.

- (k) The following message will appear. To finish the dump, select **3**.

Press number key (1:up,2:down,3:end) ?

- (l) The following message will appear. Selecting **2** returns to the FDD UTILITIES MENU.

Another dump (1:Yes,2:No) ?

5. HDD ID READ program

Selecting HDD ID displays the following HDD ID configuration.

```
[HDD ID Read (VX.XX)] [Drive #1]
Model No.              = XXXXXXXX
Press [Enter] key
```

Press **Enter** to return to the FDD UTILITIES MENU.

3.25 System Configuration

3.25.1 Function Description

NOTE: To display the system configuration, the write protect tab should be *OFF* position. If the tab is *ON* position, move the tab to *OFF* position and restart the test. Otherwise the correct information cannot be acquired.

The System Configuration program contains the following configuration information for the computer:

1. Processor Type [Code/L2 cache]
2. Chip set [VRAM]
3. BIOS ROM version [1st ID, 2nd ID]
4. Boot ROM version
5. EC total version
6. PS Microprocessor version
7. SVP Par. version
8. Microcode Revision
9. Total Memory Size [Conventional memory]
10. Battery code
11. HWSC
12. FSB [Voltage]
13. 0 Printer Adapter
14. 0 ASYNC Adapter
15. 1 Math co-processors
16. 1 Floppy Disk Drive [Track/Head/Sector]
17. 1 Hard Disk Drive [Sector/Drive size/Manufacture code]
18. T&D total version

3.25.2 Operations

Select **8** from the DIAGNOSTIC MENU and press **Enter**. Then, the following system configuration appears in the display.

```

System Configuration Display : Ver X.XX [Machine Name ???]

* - Processor Type      = XXXXXX-XXXXXXMHz      Code = XX      L2 Cache = XXXXXXKB
* - Chip set            = XXXXXX                      VGA Chip = Intel Corp
* - BIOS ROM Version   = VX.XX      1st ID = XXH, 2nd ID = XXH
* - BOOT ROM Version   = VX.XX
* - EC Total Version    = VX.XX
* - PS Micon Version    = VX.XX
* - SVP Par. Version    = VX.XX      (Panel = XXXX*XXXX Menu=XXXX Prod=XXXX)
* - Microcode Revision = VX.XX      (Processor = XXXh)
* - Total Memory Size   = XXXXXXMB (Conventional Memory = XXXXKB)
* - Battery Code        = XXXXXXXXXXXX      (Present voltage = XXXX)
* - HWSC                = XXXXXXXX
* - FSB                 = XXXXXXMHz (Voltage = XXh)
* - X Printer Adapter   LPT1 = XXXX LPT2 = XXXX LPT3 = XXXX
* - X ASYNC Adapter     COM1 = XXXX COM2 = XXXX COM3 = XXXX
* - X Math CO-Processor
* - X Floppy Disk Drive(s) Track = XX Head = XX, Sector = XX
* - X Hard Disk Drive(s) #1 Sectors = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXXXXX]
                       #2 Sectors = XXXXX, (XXXXX GB) [XXXXXXXXXXXXXXXXXXXX]
* - ODD Drive           = XXXXXXXXXXXX
* - T&D Total Version   = VX.XX

Press [Enter] Key      [Date = XXXX-YY-ZZ, XX:YY:ZZ]

```

Press **Enter** to return to the DIAGNOSTIC MENU.

3.26 Wireless LAN Test Program (Intel-made b/g, a/b/g Setting up of REF PC)

For the test of Intel-made wireless LAN cards, configure the test environment as shown below with the following equipment.

- AP (which can operate on Windows XP and is corresponding to access point 11a, 11b and 11g)

NOTE: Set the SSID of AP as follows. (Note that upper case and lower case characters are recognized as different characters.)

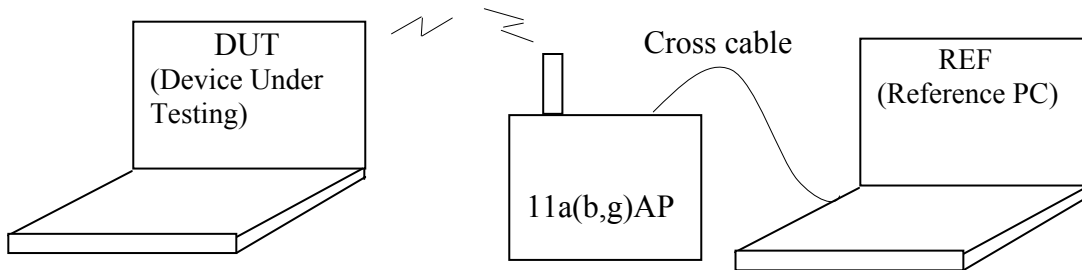
AP for check of 11a : 11aAP

AP for check of 11b : 11bAP

AP for check of 11g : 11gAP

Make the security functions of AP (WEP, WPA, etc.) invalid.

- REF (Reference) PC
- Cross cable
- DUT (Device Under Testing)



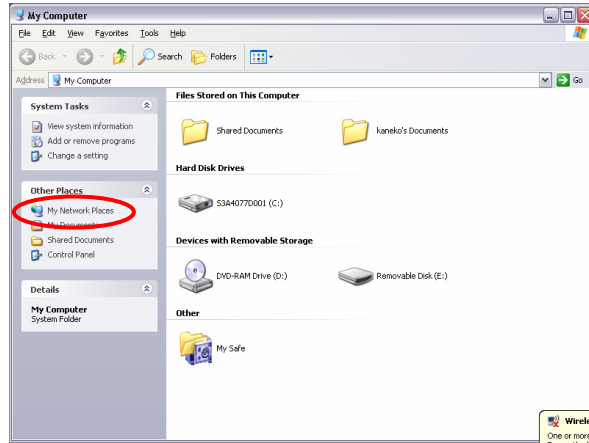
Configuration of equipment for transmitting-receiving test

How to setup the REF PC

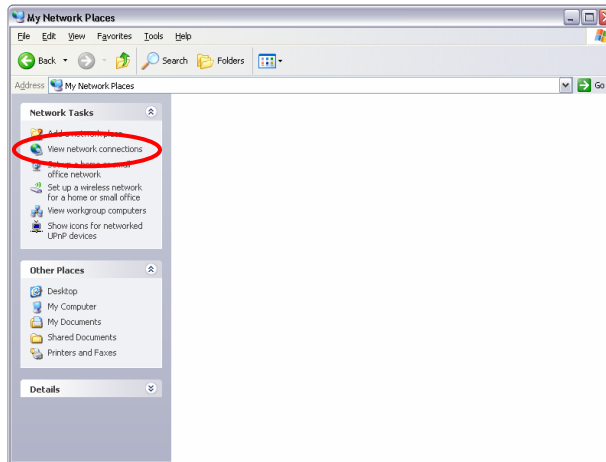
Set up the wireless LAN environment needed for the test before the start of Responder program on REF PC.

1. Copy the R100VWL5.ZIP (wireless LAN program for maintenance, common to Calxico, Golan and Kedron) to REF PC and unzip it. Then “Clx_Res” folder is created and the following three programs are copied in it.
 - PACKET.SYS
 - PACKET.INF
 - WTWINSVR.EXE

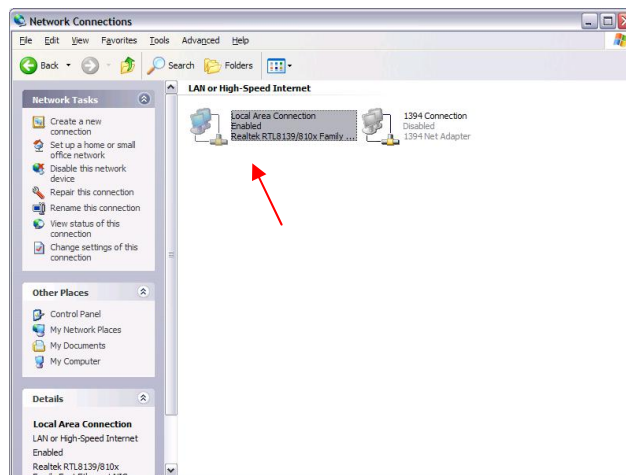
2. Open “My Computer” window and click “My Network places” on the left column.



3. Click “View network connections” on the left column.

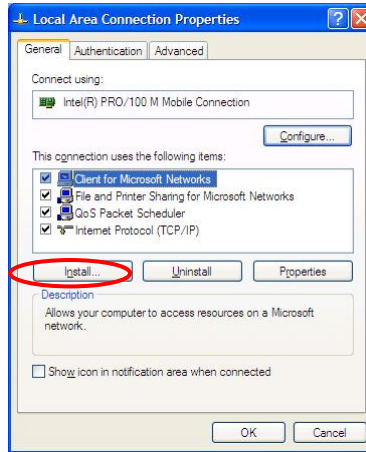


4. The “Network Connections” window appears. Double-click “Local Area Connection”.



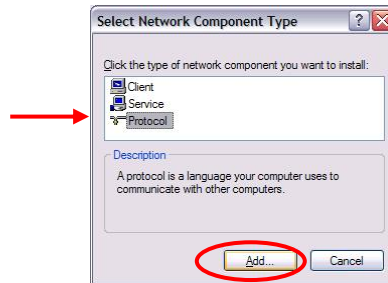
Network Connections window

5. Click “Install...” button on the “Local Area Connection Properties” window.



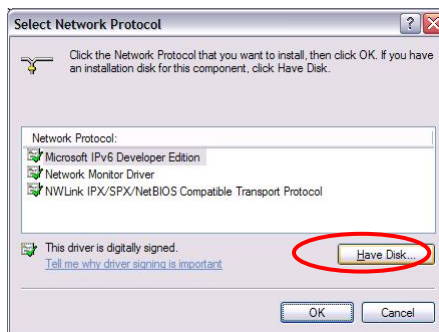
Local Area Connection Properties window

6. Select “Protocol” on the “Select Network Component Type” window and click “Add...” button.



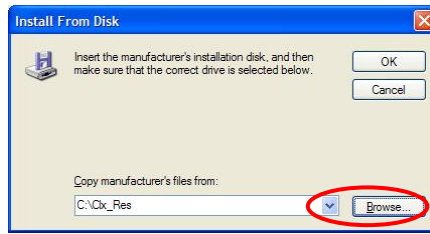
Select Network Component Type window

7. Click “Have Disk...” button on the “Select Network Protocol” window.



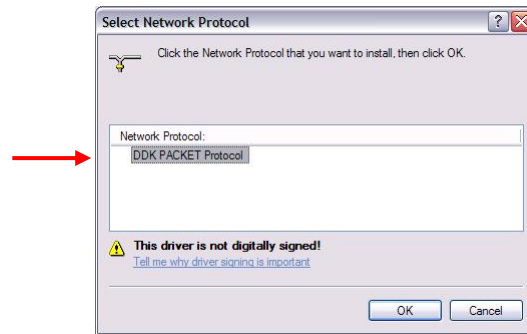
Select Network Protocol window

- When “Install From Disk” window appears, click “Browse...” and specify the created “Clx_Res” folder. Then Click “OK”. (For the test, “PACKET.INF” file is used.)



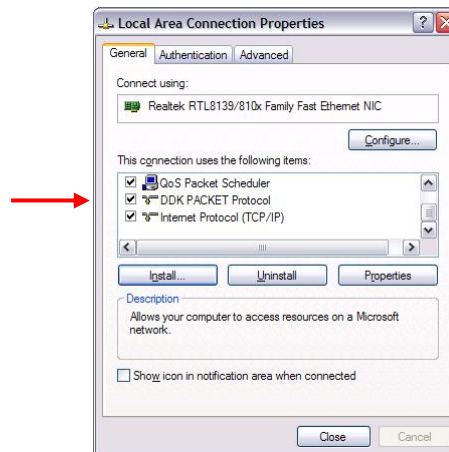
Install From Disk window

- The “Select Network Protocol” window appears again. In the “Network Protocol”, “DDK PACKET Protocol” will appear. Then click “OK” to start the installation.



Select Network Protocol window

- When the installation is completed, “Local Area Connection Properties” will appear. Confirm that the “DDK PACKET Protocol” is added. Click “Close” button to finish the setup of REF PC.



Local Area Connection Properties window

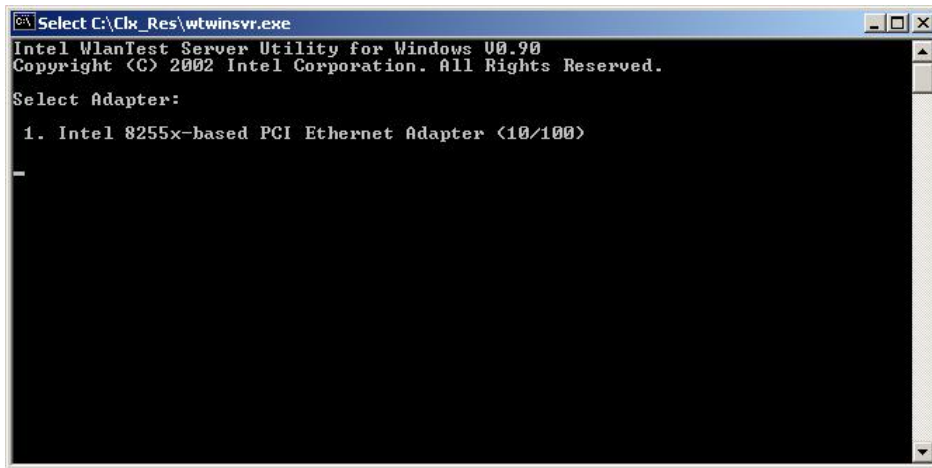
After the completion of REF PC setup, restart the WINDOWS. Then perform the Responder test program for Windows (WTWINSVR.EXE) in the Clx_Res folder.

- WTWINSVR.EXE

Function : Transmitting/receiving of data to/from DUT via AP
OS available : Windows XP only
How to start : Double-click WTWINSVR icon.

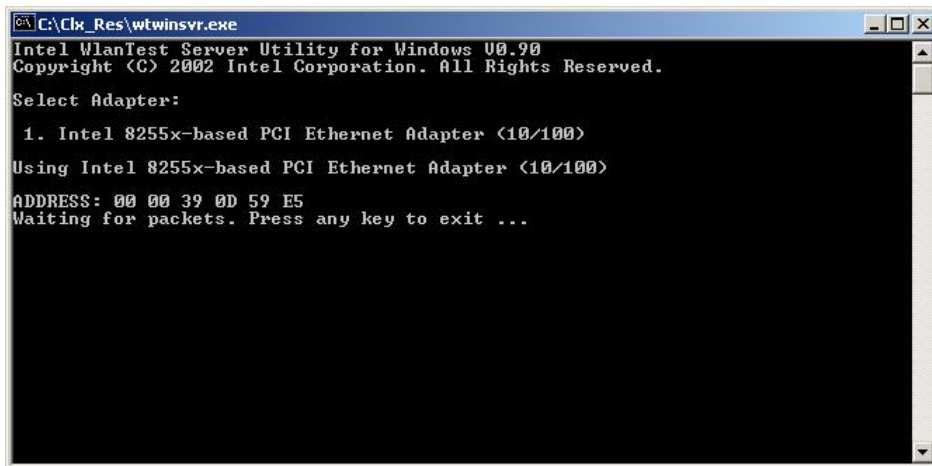
How to start

1. Double-click wtwinsvr icon. The following screen will appear.



Startup screen of wtwinsvr program

2. Enter the number of Network Adapter used on REF PC (enter **1** for example above). Then the following screen will appear. Start the test program on DUT.



Screen while running the wtwinsvr program

The REF PC is waiting for the start of the test program on DUT.

3.27 Wireless LAN Test Program on DUT PC(Intel-made)

3.27.1 Wireless LAN Test Program (Intel-made :Golan) on DUT PC

This section describes how to perform the wireless LAN transmitting-receiving test (Intel-made 802.11 b/g or 802.11 a/b/g Golan). To execute the wireless LAN test, use the Diagnostics disk for wireless LAN test.

Insert the Diagnostics disk for wireless LAN test into the Floppy Disk Drive. Turn on the power while pressing **U**.

The following menu appears in the display.

```
*****
*      Intel PRO/Wireless XXXABG Network Connection      *
*                  Maintenance T&D Menu                  *
*                                                        *
*      1   : SKU check of Module                          *
*                                                        *
*      2   : MAC Address Check                            *
*                                                        *
*      3   : Antenna Check & communication test of 11b mode *
*                                                        *
*      4   : Communication test of 11a mode               *
*                                                        *
*      5   : Communication test of 11g mode               *
*                                                        *
*      6   : All the tests of 11a/b/g Card                *
*            (SKU & MAC Check, 11a/b/g communication test) *
*                                                        *
*****
```

SELECT TEST No, (1-6) :

To execute the subtest, input the subtest number and press **Enter**.

Subtest01 SKU check of module

This subtest displays SKU information on the wireless LAN card installed. Selecting this subtest, following message will appear in the display. Confirm if the right information on the wireless LAN card is described.

```
*****
*
*      Module   : Module : Intel PRO/Wireless XXXXABG      *
*                  Network Connection (Mowl)              *
*      G-code   : G360001U110                             *
*      TA No.   : D26539                                   *
*
*****
```

Press any key and return to the test menu. If a defective is found during the test, NG message will appear in the display.

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Using a wrong wireless LAN card (Using unspecified card)
- Defective wireless LAN card

Checking the connection, execute the subtest again.

Subtest02 MAC Address Check

This subtest displays the MAC address. Selecting this subtest, following message will appear in the display.

```
*****MAC CHECK*****
MAC = XXXXXXXXXXXX
*****
*
*   MAC Address Check : OK !!
*
*****
```

Press any key and return to the test menu.

If a defective is found during the test, following message will appear in the display.

```
*****MAC CHECK*****
ERROR: MAC all F
MAC = XXXXXXXXXXXX
*****
*
*   MAC Address Check : NG !!
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Defective wireless LAN card
- Disappearance of MAC address data

Checking the connection, execute the subtest again.

Subtest03 Antenna check & communication test of 11b mode

This subtest execute transmitting/receiving test in 802.11b mode using the main antenna first. If a defective is not found during the test, transmitting/receiving test in 802.11b mode using the AUX antenna is automatically executed.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

If a defective is found during the test, **NG** message will appear in the display. When pressing any key, the following message (which antenna is defective) is displayed

```
*****
*
*   Main Antenna Test : NG !!
*
*****
*****
*
*   Aux Antenna Test : NG !!
*
*****
*****
```

Press any key and return to the test menu.

Subtest04 Communication test of 11a mode

This subtest execute transmitting/receiving test in 802.11a mode using the main antenna.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

If a defective is found during the test, **NG** message will appear in the display. When pressing any key, the following message is displayed

```
*****
*
*       11a Communication Test : NG !!
*
*****
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Defective wireless LAN card
- Disappearance of MAC address data

Checking the connection, execute the subtest again.

Subtest05 Communication test of 11g mode

This subtest execute transmitting/receiving test in 802.11g mode using the main antenna.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

If a defective is found during the test, **NG** message will appear in the display. When pressing any key, the following message is displayed

```
*****
*                                     *
*           11g Communication Test :  NG !!           *
*                                     *
*****
```

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Defective wireless LAN card
- Disappearance of MAC address data

Checking the connection, execute the subtest again.

Subtest06 All the tests of 11a/b/g Card

All the tests is executed in the order of SKU check of Module, MAC Address Check, Communication test of 11b mode, Communication test of 11a mode and Communication test of 11g mode.

When any error has detected, the test finishes.

3.27.2 Wireless LAN Test Program (Intel-made:Kedron) on DUT PC

This section describes how to perform the wireless LAN transmitting-receiving test (Intel-made 802.11 a/b/g or 802.11 a/b/g/n: kedron). To execute the wireless LAN test, use the Diagnostics disk for wireless LAN test.

Insert the Diagnostics disk for wireless LAN test into the Floppy Disk Drive. Turn on the power while pressing **U**.

The following menu appears in the display.

```
*****
*      Intel PRO/Wireless XXXABG Network Connection      *
*                  Maintenance T&D Menu                  *
*                                                         *
*      1  : SKU check of Module                          *
*                                                         *
*      2  : MAC Address Check                            *
*                                                         *
*      3  : Communication test of 11a mode                *
*                                                         *
*      4  : Communication test of 11b mode                *
*                                                         *
*      5  : Communication test of 11g mode                *
*                                                         *
*      6  : All the tests of Wireless WiFi Link 4965 Module *
*            (SKU & MAC Check, communication test)       *
*                                                         *
*****
```

SELECT TEST No, (1-6):

To execute the subtest, input the subtest number and press **Enter**.

Subtest01 SKU check of module

This subtest displays SKU information on the wireless LAN card installed. Selecting this subtest, following message will appear in the display. Confirm if the right information on the wireless LAN card is described.

```
*****
*
*      Module   : Module : Intel PRO/Wireless XXXXABG      *
*                  Network Connection (Mowl)                *
*      G-code   : G360001U110                              *
*      TA No.   : D26539                                    *
*
*****
```

Press any key and return to the test menu. If a defective is found during the test, **NG** message will appear in the display.

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Using a wrong wireless LAN card (Using unspecified card)
- Defective wireless LAN card

Checking the connection, execute the subtest again.

Subtest02 MAC Address Check

This subtest displays the MAC address. Selecting this subtest, following message will appear in the display.

```
*****MAC CHECK*****
MAC = XXXXXXXXXXXX
*****
*
* MAC Address Check : OK !!
*
*****
```

Press any key and return to the test menu.

If a defective is found during the test, following message will appear in the display.

```
*****MAC CHECK*****
ERROR: MAC all F
MAC = XXXXXXXXXXXX
*****
*
* MAC Address Check : NG !!
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Defective wireless LAN card
- Disappearance of MAC address data

Checking the connection, execute the subtest again.

Subtest03 Communication test of 11a mode

This subtest execute transmitting/receiving test in 802.11a mode using the main antenna.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

If a defective is found during the test, **NG** message will appear in the display. When pressing any key, the following message is displayed

```
*****
*
*           11a Communication Test :  NG !!
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Defective wireless LAN card
- Disappearance of MAC address data

Checking the connection, execute the subtest again

Subtest04 Communication test of 11b mode

This subtest execute transmitting/receiving test in 802.11a mode using the main antenna.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

If a defective is found during the test, **NG** message will appear in the display. When pressing any key, the following message is displayed

```
*****
*
*           11a Communication Test :  NG !!
*
*****
```

Press any key and return to the test menu.

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Defective wireless LAN card
- Disappearance of MAC address data

Checking the connection, execute the subtest again.

Subtest05 Communication test of 11g mode

This subtest execute transmitting/receiving test in 802.11g mode using the main antenna.

If a defective is not found during the test, **OK** message will appear in the display. Press any key and return to the test menu.

If a defective is found during the test, **NG** message will appear in the display. When pressing any key, the following message is displayed

```
*****
*                                     *
*           11g Communication Test :  NG !!           *
*                                     *
*****
```

When a defective is detected in the test, following typical cause is considered.

- Connection of wireless LAN card
- Defective wireless LAN card
- Disappearance of MAC address data

Checking the connection, execute the subtest again.

Subtest06 All the tests of Wireless WiFi Link 4965 Module

All the tests is executed in the order of SKU check of Module, MAC Address Check, Communication test of 11a mode, Communication test of 11b mode and Communication test of 11g mode.

When any error has detected, the test finishes.

3.28 LAN/Modem/Bluetooth/IEEE1394 Test Program

This section describes how to perform the LAN/Modem/Bluetooth/IEEE1394 test with the test program.

Insert the test program disk for LAN/Modem/Bluetooth/IEEE1394 test in FDD and turn on the power. The following message will appear:

```
Microsoft Windows XX Startup Menu
-----
```

1. LAN
2. Modem
3. Bluetooth
4. IEEE1394

Enter a choice:

Press the number you want to test and press **Enter**.

NOTE: *It is impossible to go back to startup menu once you choose the test. Therefore, LAN/Modem/Bluetooth/IEEE1394 test can not be executed successively.*

3.28.1 LAN test

To execute LAN test, press **1** and **Enter**. The following message will appear:

```
#####
##### i82562 ICHx GbE (i82540) Diagnostics program #####
#####
*
* 1 ..... (i82562 + ICHx) *
* *
* 2 ..... (GbE) *
* *
* 3 ..... (Marvel) *
* *
*****
.... Press test number [1-2] ?
```

Press the number you want to test and press **Enter**.

Subtest01 (i82562 + ICHx)

This subtest checks the operation of mini-PCI I/F by the loopback test in the chip.

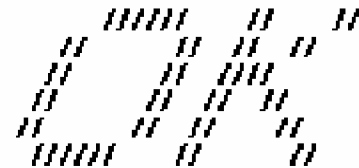
The following message will appear:

```
[LAN transmit & receive test !]
                                COMPLETED Repeat count = 00000
                                Error count  = 00000

LOOPBACK TEST

100Mbps Auto-negotiation TxRx Test
Destination Address  = xxxxxxxxxxxxxx
Source Address       = xxxxxxxxxxxxxx

** 100Base-TX Full-Duplex **
< TRANSMIT >
< RECEIVE >
```



NOTE: The menu displayed by your computer may be slightly different from the one shown above.

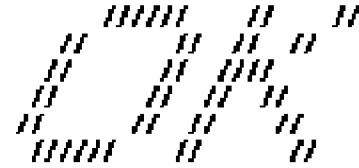
If a defective is found, **NG** message will appear in the display.

Subtest02 (GbE)

This subtest checks the operation of mini-PCI I/F by the loopback test in the chip. Select **2** to execute and press **Enter**.

The following message will appear:

```
Testing adaptor...hit <ESC> to abort.  
*  
External Loopback Test...PASSED  
Testing completed.  
*  
*  
Loopback Test Complete  
*  
*  
* 1000Base Auto-negotiation TxRx Test  
*  
* CE Test Complete
```



NOTE: *The menu displayed by your computer may be slightly different from the one shown above.*

If a defective is found, **NG** message will appear in the display.

Subtest03 (Marvel)

NOTE: *This Subtest is not supported in this computer.*

3.28.2 Modem test

For this subtest, connect the modem PCB and RJ11 connector with a harness. Use the dedicated “FAT-MODE inspection device (product code: QE2000P01 made by Nitto Denki Seisakusyo)” for the tests.

NOTE: *Modem test is not supported for this model.*

```
#####
#####      AC97' Modem Controller Diagnostics program      #####
#####
*
*          1 ..... (ICHx)
*
*          2 ..... (ICH6)
*
*****
.... Press test number[1-2] ?
```

To execute Modem test, press **2** and **Enter**. Following message will appear:

```
[Modem loopback test !]
ICHx MDC Test Program with Modem Sound (Line Test)
Version X.X
* Scorpio Modem Initialize           :OK
* Digital Loopback Test              :OK
* RJ11 Connector Check (LED)        :(Operator's Check!!)
```

OK is displayed when a error is detected, **NG** is display when a error is not detected.

NOTE: *The menu displayed by your computer may be slightly different from the one shown above.*

RJ11 Connection Check (LED) (Operator's Check LED) test will be executed, and the following message will appear:

```
...Press Key (Y = OK , N =NG)
```

If the color in the LED of the connection checker is orange, press **Y**, otherwise, press **N**.

3.28.3 Bluetooth test

Preparation

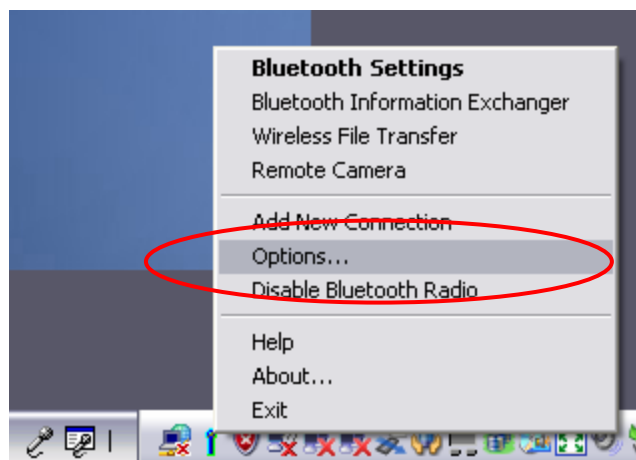
- For the test of Bluetooth function, use the Windows program installed on the target computer (computer to be tested). A responder device (device for transmitting/receiving data) is also needed. (A mobile phone with the Bluetooth function is also available.)
- A Bluetooth card should be installed on the target computer. Install the Bluetooth function by clicking [All Programs] -> [TOSHIBA] -> [Bluetooth] -> [Bluetooth Settings].

Test procedure

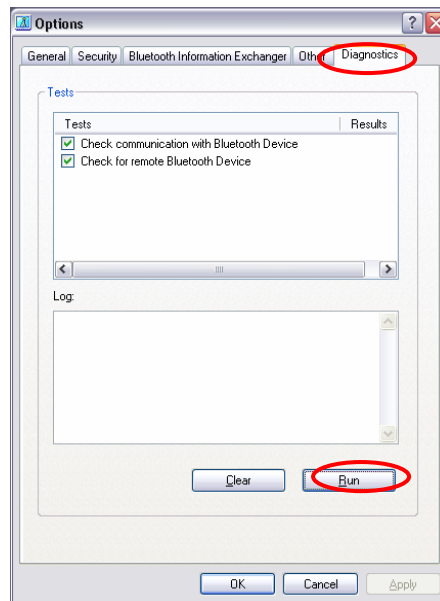
1. Enable the Bluetooth function of the responder device.
2. Make sure the wireless communication switch of the target computer is set to “ON” position.
3. Right-click the Bluetooth icon on the lower right screen of the target computer.



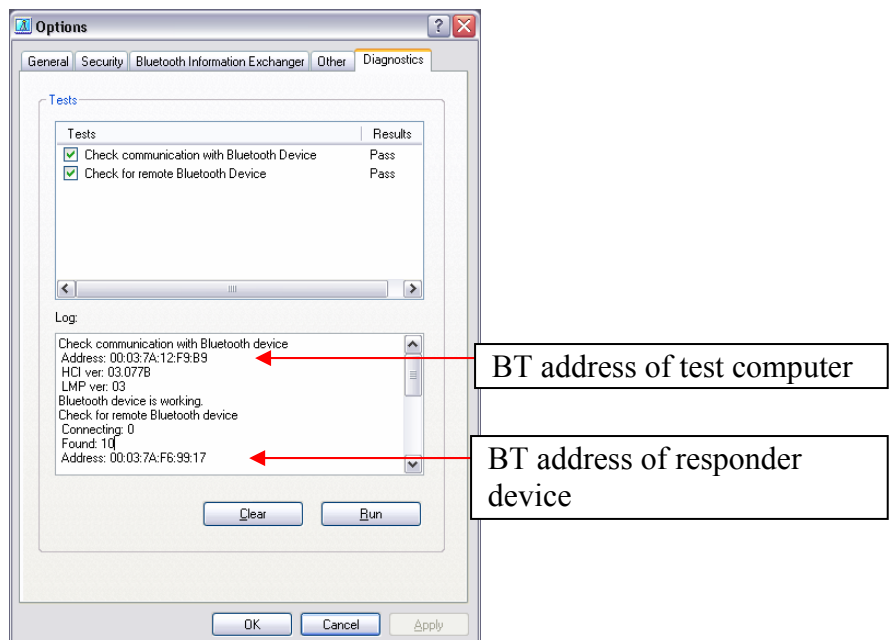
4. Select “Options...”.



5. Select “Diagnostics” tab and click “Run”.



6. Check the “Log” to confirm the test result.



7. When the BT (Bluetooth) address of the responder device appears, the Bluetooth card and antenna connection are OK.

If the BT address of the responder device does not appear, check the Bluetooth card condition and antenna cable connection to the Bluetooth card by disassembling the computer following the steps described in Chapter 4, *Replacement Procedures*.

3.28.4 IEEE1394 test

To execute this test, press **4** and **Enter**.

NOTE: *IEEE1394 test is not supported for this model.*

NOTE: *Use another computer that can communicate by IEEE1394 (i. Link) cable as a reference machine to perform this test.*

The following menu will appear:

```

*****
*****      IEEE1394[XXXXX] Diagnostics program      *****
*****
*
*          1 ....(Transmit & Receive test)           *
*
*          2 ....(Responder set)                     *
*
*          3 ....(1394 GUID Display)                  *
*
*****
.... Press test number[1-3] ?

```

To execute the TEST, select the test number you want to execute and press **Enter**.

Subtest01 Transmit & Receive test

NOTE: *Before executing subtest 01, be sure to execute subtest 02 in the responder machine.*

This program checks the data transporting between responder machine and target machine and compare them with the original data through the IEEE1394 cable.

Subtest 02 Responder set

This program is executed in the responder machine to initialize the responder machine with the IEEE1394 cable connected to the target machine before executing subtest 01.

Subtest 03 1394 GUID Display

This program checks the GUID of IEEE1394.

3.29 Sound Test program

This section describes how to perform the Sound test. To execute the sound test, refer to the following description.

Prepare a HDD and format it on DOS. Copy all files in the floppy disk in which the Sound test program is stored to the HDD. Reboot the computer from the HDD. The following message will appear:

```
#####
#####      WSS, Sound blaster pro Diagnostics program      #####
#####
*
*      1 .....      Sound (Standard)      *
*
*      2 .....      Sound (Legacy)      *
*
*      3 .....      CD Sound (Standard)      *
*
*      4 .....      CD Sound (Legacy)      *
*
*      ---It outputs at the speaker and lineout---      *
*
*****
.... Press test number[1-4] ?
```

Input the test number and press **Enter**.

3.29.1 Sound (Standard) test

To execute the Sound (Standard) test, press **1** and **Enter**. The following menu will appear in the display.

```
#####
#####      ICH4-M + AD1981A Diagnostics program      #####
#####
*
*      1 .....      ( Microphone recording & play )      *
*
*      2 .....      ( Sine wave )      *
*
*      3 .....      ( Line IN recording & play )      *
*
*      9 .....      Exit to Main      *
*
*****
.... Press test number[1-3, 9] ?
```


To return to the Sound test menu, press **9** and **Enter**. Then following message will appear in the display.

```
*****
*****  May I Restart ?  *****
*****
Press any key to continue..
```

After pressing any key, the machine starts rebooting and sound test menu will appear in the display.

Subtest 01 Microphone recording & play

This subtest checks the function of the CODEC A/D, D/A converter.

When this subtest is selected, the following message will appear.

```
[Recording & play test !]
```

And the following message will appear.

```
DOS/4GW Protected Mode Run-time Version X.XX
Copyright (c) Tenberry Software, Inc. XXXX
```

After this message appears, display stops briefly. In this timing, sound is recorded from internal microphone.

After the recording is completed, the computer plays back the sound recorded after the following message.

```
STACWAVE Version X.XX
Build data: XXX XX XXXX at XX:XX:XX
Loading "mic.wav".
```

| |
|--|
| <p>NOTE: <i>The message in the display might have slight difference from those above.</i></p> |
|--|

The display returns to the Sound (Standard) test menu after the test ends.

Subtest 02 Sine wave

This subtest is executed by loading the COM file (ADSIN.COM). The program expands sine wave data table from 16KB to 64KB, and creates the play data. Then it transfers the data between the DMA and the CODEC to play the sine wave. (It sounds like a continuous beep). By using wave measurable devices such as an oscilloscope, the data can be measured as a sine wave.

When the subtest is executed, the sine wave is played while expanding sine wave from 16KB to 64KB.

The display returns to the Sound (Standard) test menu after the test ends.

Subtest 03 Line IN recording & play

This subtest executes the same test as the subtest01 by recorded sound from the different port (Line-in port).

For more details on the subtest, refer to the subtest01 Microphone recording & play.

The display returns to the Sound (Standard) test menu after the test ends.

3.29.2 Sound (Legacy) test

To execute the Sound (Legacy) test, select **2** and press **Enter**.

| |
|---|
| NOTE: <i>Sound (Legacy) test is not supported in this model.</i> |
|---|

3.29.3 CD Sound (Standard) test

To execute the CD Sound (Standard) test, press **3** and **Enter**. Insert the test media (TOSHIBA TEST CD-ROM or ABEX TEST CD-ROM) or music CD on the market (if the test media can not be prepared). Following menu appears in the display.

For details on use of test media, refer to 3.29.3.1 Test media (Toshiba-made test media).
For details on use of audio CD on the market, refer to 3.29.3.2 Audio CD.

3.29.3.1 Test media (Toshiba-made test media)

```
CD/DVD TEST  IN PROGRESS  XXXXXXXX
```

```
xxxxxxx DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] : test end
[Ctrl]+[C]      : key stop
```

```
SUB-TEST      : XX
PASS COUNT    : XXXXX      ERROR COUNT: XXXXX
WRITE DATA   : XX         READ DATA  : XX
ADDRESS       : XXXXXXX    STATUS       : XXX
```

```
01 - Japanese Narration
02 - English Narration
03 - Test Tone A (100Hz - 20Hz)
04 - Test Tone B (400Hz - 3KHz L-R)
```

```
Drive # = 0, ATAPI status =00
Command = XX
[[Block address = XXXXXXXXX]]
[[Block length  = XXXXXXXXX]]
Final : Block address = XXXXXXXXX
```

Subtest 01 Japanese Narration

Selected this subtest, narration in Japanese starts and following message appears in the display.

```
Play start CD sound !
Press any key <Play stop>.
```

Press any key and stop the narration. Then return to the CD Sound (Standard) test menu.

Subtest 02 English Narration

Selected this subtest, narration in English starts.

For more details on the procedure, refer to the subtest01.

Subtest 03 Test Tone A

CAUTION: *Before starting subtest03, be sure to set the sound at proper volume.*

This subtest plays sine wave while changing its table from 100Hz to 20Hz.

The test returns to the CD Sound (Standard) menu after the test ends.

Subtest 04 Test Tone B

This subtest plays sine wave while changing its table from 400Hz to 3KHz and also changing the channel from left speaker to right speaker.

The test returns to the CD Sound (Standard) menu after the test ends.

CAUTION: *This model does not support the CD Sound (Standard) test.*

3.29.3.2 Audio CD

Insert an audio CD and the following menu appears in the display.

```
CD/DVD TEST  IN PROGRESS XXXXXXXX
```

```
xxxxxxx DIAGNOSTIC TEST VX.XX
[Ctrl]+[Break] ; test end
[Ctrl]+[C]      ; key stop
```

```
SUB-TEST      : XX
PASS COUNT    : XXXXX      ERROR COUNT: XXXXX
WRITE DATA   : XX         READ DATA  : XX
ADDRESS       : XXXXXXXX   STATUS        : XXX
```

CD Sound track number (01-98 : Track) ?

```
Drive # = 0, ATAPI status =00
Command = XX
[[Block address = XXXXXXXXX]]
[[Block length  = XXXXXXXXX]]
Final : Block address = XXXXXXXXX
```

Select the track number you want to test and press **Enter** twice.

The following message appears in the display and selected track is played.

```
Play start CD sound !
Press any key <play stop>
```

After pressing any key, the music stops and the display returns to the selection menu of the track number.

NOTE: *When the CD-ROM test is executed, [ALL DEVICE] must be selected in the "Device Config.=" of the BIOS SETUP. If the "ALL DEVICE" is not selected, music can not be played.*

3.29.4 CD Sound (Legacy) test

To execute the CD Sound (Legacy) test, select **4** and press **Enter**.

CAUTION: *Sound (Legacy) test is not supported in this model.*

3.30 SETUP

3.30.1 Function Description

This program displays the current system setup information as listed below:

1. Memory
 - (a) Total
2. System Date/Time
 - (a) Date (MM-DD-YYYY)
 - (b) Time (HH:MM:SS)
4. Password
 - (a) User Password
 - (b) Supervisor Password
5. HDD Password
 - (a) HDD
 - (b) HDD Password Mode
 - (c) User Password
 - (d) Master Password
6. Boot Priority
 - (a) Boot Priority
 - (b) HDD Priority
7. Others
 - (a) Core Multi-Processing
 - (b) Dynamic CPU Frequency Mode
 - (c) Execute-Disable Bit Capability
 - (d) Virtualization Technology
 - (e) Auto Power On
 - (f) Beep Volume
 - (g) Diagnostic Mode

8. Configuration
 - (a) Device Config.
9. Battery
 - (a) Battery Save Mode
 - (b) PCI Express Link ASPM
 - (c) Enhanced C-States
10. I/O ports
 - (a) Serial
11. Drives I/O
 - (a) Built-in HDD
 - (b) Select Bay
12. PCI Bus
 - (a) PCI Bus
13. Display
 - (a) Power On Display
14. Peripheral
 - (a) Internal Pointing Device
15. Legacy Emulation
 - (a) USB KB/Mouse Legacy Emulation
 - (b) USB-FDD Legacy Emulation
 - (c) USB Memory BIOS Support Type
16. PCI LAN
 - (a) Built-in LAN
17. Security Controller
 - (a) TPM

3.30.2 Accessing the SETUP Program

Turn on the power while pressing **ESC**, the following menu appears.

Check system. Then press [F1] key.

Then press **F1**. The following display appears.

| | |
|---|---|
| <small>Core-Multi Processing</small> | <small>ACPI BIOS version = X.XX</small> |
| <p style="text-align: center; margin: 0;">MEMORY</p> <p>Total = XXXXX MB</p> | <p style="text-align: center; margin: 0;">BOOT PRIORITY</p> <p>Boot Priority = HDD → FDD → CD-ROM → LAN</p> <p>HDD Priority = Built-in HDD → Second HDD → USB</p> |
| <p style="text-align: center; margin: 0;">SYSTEM DATE/TIME</p> <p>Date (MM-DD-YY) = XX-XX-XXXX</p> <p>Time (HH:MM:SS) = XX:XX:XX</p> | <p style="text-align: center; margin: 0;">OTHERS</p> <p>Core Multi-Processing = Enabled</p> <p>Dynamic CPU Frequency Mode = Dynamically Switchable</p> <p>Execute-Disable Bit Capability = Available</p> <p>Virtualization Technology = Disabled</p> <p>Auto Power On = Disabled</p> <p>Beep Volume = Medium</p> <p>Diagnostic Mode = Disabled</p> |
| <p style="text-align: center; margin: 0;">PASSWORD</p> <p>User Password = Not Registered</p> <p>Supervisor Password = Not registered</p> | |
| <p style="text-align: center; margin: 0;">HDD PASSWORD</p> <p>HDD = Built-in HDD</p> <p>HDD Password Mode = Master+User</p> <p>User Password = Not Registered</p> <p>Mastere Password = Not registered</p> | |

↓↑←→: Select items **Space, BkSp**: Change values **PgDn, PgUp**: Change pages
Esc: Exit without saving **Home**: Set default values **End**: Save changes and Exit

SYSTEM SETUP (2/2) ACPI BIOS version = X.XX

| | |
|--|--|
| <p style="text-align: center;">CONFIGURATION</p> Device Config. = Setup by OS | <p style="text-align: center;">DISPLAY</p> Power On Display = Auto-Selected |
| <p style="text-align: center;">BATTERY</p> Battery Save Mode = Full Power PCI Express Link ASPM = Enabled Enhanced C-States = Enabled | <p style="text-align: center;">PERIPHERAL</p> Internal Pointing Device = Enabled |
| <p style="text-align: center;">I/O PORTS</p> Serial = COM1 (3F8H/IRQ4) | <p style="text-align: center;">LEGACY EMULATION</p> USB KB/Mouse Legacy Emulation = Enabled USB-FDD Legacy Emulation = Enabled USB Memory BIOS Support Type = HDD |
| <p style="text-align: center;">DRIVES I/O</p> Built-in HDD = Serial ATA Port0 Select Bay = Primary IDE (1F0H/IRQ14) | <p style="text-align: center;">PCI LAN</p> Built-in LAN = Enabled |
| <p style="text-align: center;">PCI BUS</p> PCI BUS = IRQ10, IRQ11 | <p style="text-align: center;">SECURITY CONTROLLER</p> TPM = Disable |

↓↑←→: Select items **Space, BkSp**: Change values **PgDn, PgUp**: Change pages
Esc: Exit without saving **Home**: Set default values **End**: Save changes and Exit

Moving Within the SETUP Menu and Changing Values

1. Press **←** and **→** to move between the two columns. Press **↑** and **↓** to move between items in a column. Press **Fn+↑ (PgUp)** and **Fn + ↓ (PgDn)** to move between the two pages.
2. Press either the **Space bar** or **Back Space** to change the value.

Accepting Changes and Exiting the SETUP Window

1. Press **End** to accept the changes you made.

If the changed item does not require the system to reboot, the following message is displayed:

Are you sure? (Y/N)

If the changed item requires the system to reboot, the following message is displayed:

Are you sure? (Y/N)
The changes you made will cause the system to reboot.

2. To make other changes, press **N**. Repeat the steps above.
3. To accept the changes, press **Y**.

NOTE: You can press **Esc** to quit at any time without saving changes. *SETUP* asks you to confirm that you do not want to save your changes. When *SETUP* is displayed at the next time, the current configuration appears.

The Factory Preset Configuration

When you access SETUP, the current configuration is displayed.

1. To show the factory preset configuration, press **Home**.
2. Press **End** and then press **Y** to accept the factory preset settings.

NOTE: *When you execute the default setting, the following settings are not changed:*
Password
Execute-Disable Bit function

SETUP Options

The SETUP screen is divided into functionally related groups. This section describes each group and its options.

1. Memory

This group of options displays the computer's memory.

(a) Total

This field displays the total amount of memory installed and is automatically calculated by the computer. You cannot change this value.

2. System Date/Time

Use this option to set the computer's system date/time.

(a) Date

Use this option to set the system date of the computer.

(b) Time

Use this option to set the system time of the computer.

3. Password

(a) User Password

This option allows you to set or reset the user password for power on.

Registered A password has been registered.

Not Registered Change or remove the password. (Default)

(c) Supervisor Password

This setting, which is displayed on the first page of the setup screen, allows you to register a Supervisor Password of the computer.

Registered Supervisor Password has been registered.

Not Registered Supervisor Password has not been registered (Default).

For details on setting the password, refer to the Online Manual.

4. HDD Password

This option sets HDD password. HDD password is a security function to protect the built-in HDD.

(a) HDD

This item selects the hard disk to set HDD password.

Built-in HDD Sets HDD password for the built-in HDD

(b) HDD Password Mode

This item registers HDD password and can be selected only for registering HDD password. To change HDD Password Mode when HDD password is registered, delete the registered HDD password first, and then register new password.

User Only Sets only User HDD Password (Default)

Master+User Sets Master HDD Password and User HDD Password

(c) User Password

This item sets User password.

For details on setting user password, refer to the User's Manual.

(d) Master Password

This item sets the Master HDD password.

This can be set **Master+User** is set in the HDD password Mode. For details, refer to the User's Manual.

5. Boot Priority

This tab sets the priority for booting the computer and the priority for the built-in HDD or optional secondary HDD.

(a) Boot Priority

| | |
|----------------------------|---|
| HDD→FDD→CD-ROM→LAN: | The computer looks for bootable files in the following order: HDD, FDD, CD-ROM and LAN. (Default) |
| FDD→HDD→CD-ROM→LAN: | The computer looks for bootable files in the following order: FDD, HDD, CD-ROM and LAN. |
| HDD→CD-ROM→LAN→FDD: | The computer looks for bootable files in the following order: HDD, CD-ROM, LAN and FDD. |
| FDD→CD-ROM→LAN→HDD: | The computer looks for bootable files in the following order: FDD, CD-ROM, LAN and HDD. |
| CD-ROM→LAN→HDD→FDD: | The computer looks for bootable files in the following order: CD-ROM, LAN, HDD and FDD. |
| CD-ROM→LAN→FDD→HDD: | The computer looks for bootable files in the following order: CD-ROM, LAN, FDD and HDD. |

NOTE: *CD-ROM refers to a DVD-ROM&CD-R/RW drive or DVD Super Multi drive.*

(b) HDD Priority

This option enables to select the priority for the Built-in HDD, Second HDD or USB.

Built-in HDD→ Second HDD→USB (Default)

Second HDD→Built-in HDD→ USB

Built-in HDD→ USB →Second HDD

Second HDD→ USB →Built-in HDD

USB →Built-in HDD → Second HDD

USB → Second HDD →Built-in HDD

7. Others

Whether or not you need to configure the computer with these options depends primarily on the kind of software or peripherals you use.

(a) Core-Multi Processing

NOTE: This is not displayed in PCs with a single core CPU.

The Core Multi-Processing sets the CPU operating mode.

Enabled Enables Core Multi-Processing functions. (Default)

Disabled Disables Core Multi - Processing functions.

(b) Dynamic CPU Frequency Mode

Use this option to choose a setting from the followings.

Dynamically Switchable

Enables Intel SpeedStep technology. When the computer is in use, the CPU power consumption and clock speed are automatically switched when necessary. (Default)

Always High Disables Intel SpeedStep technology and always runs the processor at its fastest speed.

Always Low Disables Intel SpeedStep technology and always runs the processor at low power consumption and low speed.

(c) Execute-Disable Bit Capability

Selects the function to reports whether the CPU Execute-Disable Bit is available or not to OS. When the CMOS is damaged, the default is **Available**. When **Home** is pressed, the setting is not changed and the setting is kept.

Available Reports that the function is available. (Default)

Not Available Reports that the function is not available.

(d) Virtualization Technology

Virtualization Technology sets enable or disable of the Intel Virtualization Technology installed in the CPU.

Intel Virtualization Technology is the technique that allows one machine to operate as multiple virtual machines.

Enabled Enables Virtualization Technology.

Disabled Disables Virtualization Technology. (Default)

Virtualization Technology

(e) Auto Power On

Use this option to set a time and date for automatic power on and enable or disable the ring indicator feature. **Alarm Date Option** appears only when **Alarm Time** is enabled.

| OPTIONS | |
|--------------------------|------------|
| Alarm Time | = Disabled |
| Wake-up on LAN | = Disabled |
| on Battery | = Disabled |
| Critical Battery Wake-up | = Enabled |

Set the parameters for the Auto Power On (automatic power on) function and the Wake-up on LAN in the “OPTIONS” window. To set the time, use **Space** or **BackSpace**. Press ↓ to move the cursor to the right and ↑ to move the cursor to the left when you set the date and time.

For the **Alarm Time**, set the time to turn on the power automatically. The “second” cannot be set. When it is set to “Disabled”, the time to turn on automatically is not set.

The **Wake-up on LAN** is a function to turn on the power automatically by the call from the administrator. It can be set to “Enabled” only when “Built-in LAN” is set to “Enabled”. To activate this function, use the AC adapter.

On Battery

The following settings can be changed when the Wake-up on LAN is Enabled.

| | |
|-----------------|---|
| Enabled | Wake-up on LAN function whenoperating from the battery. |
| Disabled | Wake-up on LAN function whenoperating from the battery (Default). |

NOTE: 1. Do not remove the AC adapter and battery pack at the same time when you use this feature. If you do so, data saved by the resume function will be lost. You must also reset this option.

2. When a password is set in Password Security, the system is in standby mode, the Timer on function (Auto Power PN) is set and the system is booted, “Password =” is displayed. When the password set in Password Security is input, the computer returns to Windows from standby mode.

3. This function is effective only once, it is released after booting up.

Critical Battery Wake-up

Configures what action is taken when the remaining battery power is close to running out while the system is in Sleep Mode. This setting is only available when the Critical battery action within Power Options in Windows is set to Hibernate. (Default)

The operation of this function is dependent upon battery status.

Note: The Critical Battery Wake-up only operates with Windows Vista™.

Enabled When the remaining battery power is about to run out while the system is in Sleep Mode, the system is automatically woken up and then switched to Hibernation Mode (Default).

Disabled No action is taken even if the remaining battery power is about to run out while the system is in Sleep Mode.

Warning Turning off your computer where electronic devices are regulated or controlled. When you have to turn off your computer aboard an aircraft or in places where electronic devices are regulated or controlled, always shut down the computer completely or put the computer into Hibernation Mode instead of allowing it to go into Standby Mode (Sleep Mode) and turn off any wireless communication switches or devices. While in Standby Mode (Sleep Mode), the computer operating system may reactivate itself to run preprogrammed tasks or to preserve unsaved data, and might interfere with aviation or other systems, possibly causing serious injury.

(f) Beep Volume

This option selects the volume of beep (Warning). “OFF”, “Low”, “Medium” (Default) or “High” can be selected. If a memory module that does not comply with the standards, the computer beeps at maximum volume.

(f) Diagnostic Mode

This option sets whether the BIOS Setup Diagnostic test is enabled.

Disabled The Diagnostic test is disabled. (Default)

Enabled The Diagnostic test is enabled.

8. Configuration

This option displays the configuration method.

(a) Device Config.

The devices are initialized when the PNP OS loads.

Setup by OS Initializes devices, which is needed to load an operating system. Operating system initializes other devices. (Default)

All Devices All devices will be initialized.

If you are using an OS that does not have PNP capacity, select “All Devices.” The Display shows the following message:

Device Config. = All Devices

9. Battery

This option is used to select Full Power, Low Power or User Setting of the battery save mode.

Full Power The following shows full power settings.

```

Full Power
Processing Speed = High
CPU Sleep Mode  = Enabled
LCD Brightness  = Super-Bright
Cooling Method  = Maximum Performance

```

Low Power The following shows low power settings.

```

Low Power
Processing Speed = Low
CPU Sleep Mode  = Enabled
LCD Brightness  = Bright
Cooling Method  = Battery Optimized

```

NOTE: *The brightness is when a AC adaptor is connected. When powered by a battery it is displayed as follows.*

Battery Save Mode = Full power : LCD Bright ness = Bright.

Battery Save Mode = Low power: LCD Bright ness = Semi-Bright.

(a) Battery Save Mode

When “User Setting” is selected, the sub-window, BATTERY SAVE OPTION is displayed. The following set of options can be selected in the submenu.

Processing Speed

This feature changes the CPU processing speed.

High CPU operates at high speed. (Default)

Low CPU operates at low speed.

CPU Sleep Mode

Use this option to enable or disable the CPU sleep function.

Enabled Enables sleep mode. (Default)

Disabled Disables sleep mode.

LCD Brightness

Use this option to set the level of LCD brightness.

Super-Bright Full brightness for maximum visibility.

Bright Full brightness for high visibility. (Default)

Semi-Bright Less than full brightness for saving power.

Cooling Method

If the CPU becomes too hot, the fan turns on or the processing speed is lowered automatically. When the CPU temperature falls to a normal range, the fan turns off.

Maximum performance If the CPU becomes too hot, the fan turns on automatically at a high speed to cool down the CPU.(Default)

Performance If the CPU becomes too hot, the fan turns on automatically. When the CPU temperature falls to a normal range, the fan turns off.

| | |
|--------------------------|---|
| Battery optimized | If the CPU becomes too hot, the processing speed is lowered. If the temperature is still too high, the fan turns on. When the CPU temperature falls to a normal range, the fan is turned off and the processing speed is increased. |
| Cooling optimized | If the CPU becomes too hot, the fan turns on automatically in a high speed to cool down the CPU. Gives priority to the decrease of temperature at the bottom of the PC. |

(b) PCI Express Link ASPM

| | |
|-----------------|--|
| Enabled | Saves power consumption, when the PCI Express device is not used. (Default) |
| Auto | Saves power consumption, when the PCI Express device is not used while the battery is working. |
| Disabled | Disables the power saving function and gives priority to the performance. |

(c) Enhanced C-States

This feature enables or disables the Enhanced C-States.

| | |
|-----------------|---|
| Enabled | This lowers the power consumption. |
| Disabled | This does not lower the power consumption |

10. I/O ports

This option controls settings for the parallel port.

NOTE: Do not assign the same interrupt request level and I/O address to the serial port and PC card.

(a) Serial

Use this option to set the COM level for the serial port. The serial port interrupt request level (IRQ) and I/O port base address for each COM level is shown below:

| COM level | Interrupt level | I/O address | |
|-----------|-----------------|-------------|-----------------------|
| COM1 | 4 | 3F8H | (Serial port default) |
| COM2 | 3 | 2F8H | |
| COM3 | 4 | 3E8H | |
| COM3 | 5 | 3E8H | |
| COM3 | 7 | 3E8H | |
| COM4 | 3 | 2E8H | |
| COM4 | 5 | 2E8H | |
| COM4 | 7 | 2E8H | |
| Not Used | Disables port | | |

11. Drives I/O

This option displays the address and interrupt level for hard disk drive, optical drive and PC card. It is for information only and cannot be changed.

(a) Built-in HDD

This item displays the Serial ATA Port Number. It is for information only and cannot be changed.

Serial ATA Port0

(b) Select Bay

This option is displayed only when the hard disk drive or optical disk drive is installed to the select bay. **Primary IDE (1F0H/IRQ14)** computer selectable bay HDD.

12. PCI Bus

This item displays the interrupt level for the Card Bus. It is for information only and cannot be changed.

PCI BUS = IRQ10, IRQ11

13. Display

This group of options configures the computer's display.

(a) Power On Display

This option is used to select the display when booting up.

Auto-Selected Selects an external monitor if one is connected.
Otherwise it selects the internal LCD. (Default)

LCD+AnalogRGB Selects both the internal LCD and the external monitor
for simultaneous display.

NOTE: Pressing **Fn+F5** changes the display setting in the order of internal LCD to simultaneous to external monitor.

14. Peripheral

Use this option to select the parallel port mode and hard disk mode.

(a) Internal Pointing Device

This option enables and disables the Dual Point.

Enabled Enables the Dual Point. (Default)

Disabled Disables the Dual Point.

15. Legacy Emulation.

(a) USB KB/Mouse Legacy Emulation.

Use this option to enable or disable USB KB/Mouse Legacy Emulation. If your operating system does not support USB, you can still use a USB mouse and keyboard by setting the **USB KB/Mouse Legacy Emulation** item to **Enabled**.

Enabled USB Legacy Support can be used. (Default)

Disabled USB Legacy Support cannot be used.

(b) USB-FDD Legacy Emulation.

Use this option to enable or disable USB-FDD Legacy Emulation.

Enabled USB Legacy Support can be used. (Default)

Disabled USB Legacy Support cannot be used.

(c) USB Memory BIOS Support Type

Sets the type of the USB memory as a startup device.

HDD Set the type of the USB memory to be equivalent to the HDD (Default).

Based on the [HDD] order in the [Boot Priority Options] item. The order with respect to the other HDD can be set in the [HDD Priority Options] item.

FDD Set the type of the USB memory to be equivalent to the FDD.

Based on the [FDD] order in the [Boot Priority Options] item.

16. PCI LAN

This option enables/disables the Built-in LAN functions.

(a) Built-in LAN

Enabled Enables Built-in LAN functions. (Default)

Disabled Disables Built-in LAN functions.

17. Security controller

(a) TPM

Disables the security controller called TPM (Trusted Platform Module).

When the cursor is on the **Enable (Disable)** and the **Space** is pressed, message is displayed and the PC waits **Y** or **N** key input by the user.

When **Y** is pressed, it is sets to **Enable (Disable)**. After changing, the cursor could not be moved on the **TPM** tem. This option can be changed after rebooting.

Disabled Disables the TPM. (Default)

Enabled Enables the TPM.

(b) Clear TPM Owner

This is not displayed when the **TPM** is set to **Disabled**. This is executed, when the PC is disposed or the owner of the PC changes.

When the cursor is on this item and the **Space** is pressed, message is displayed and the PC waits **Y, E, S** and **Enter** key inputs by the user.

When **Y, E, S** and **Enter** keys are pressed, the data is disposed.

After changing, the display of **TPM** item is changed to **Disabled** and this item becomes not displayed and the cursor could not be moved on the **TPM** item.

Chapter 4

Replacement Procedures

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4.1 Overview

This chapter describes the procedure for removing and replacing the field replaceable units (FRUs) in the PC. It may not be necessary to remove all the FRUs in order to replace one. The chart below provides a guide as to which other FRUs must be removed before a particular FRU can be removed. The numbers in the chart indicate the relevant section numbers in this manual.

In all cases when removing an FRU, the battery pack must also be removed. When repairing an FRU that is the potential cause of a computer fault, use the chart to determine the order in which FRUs need to be removed.

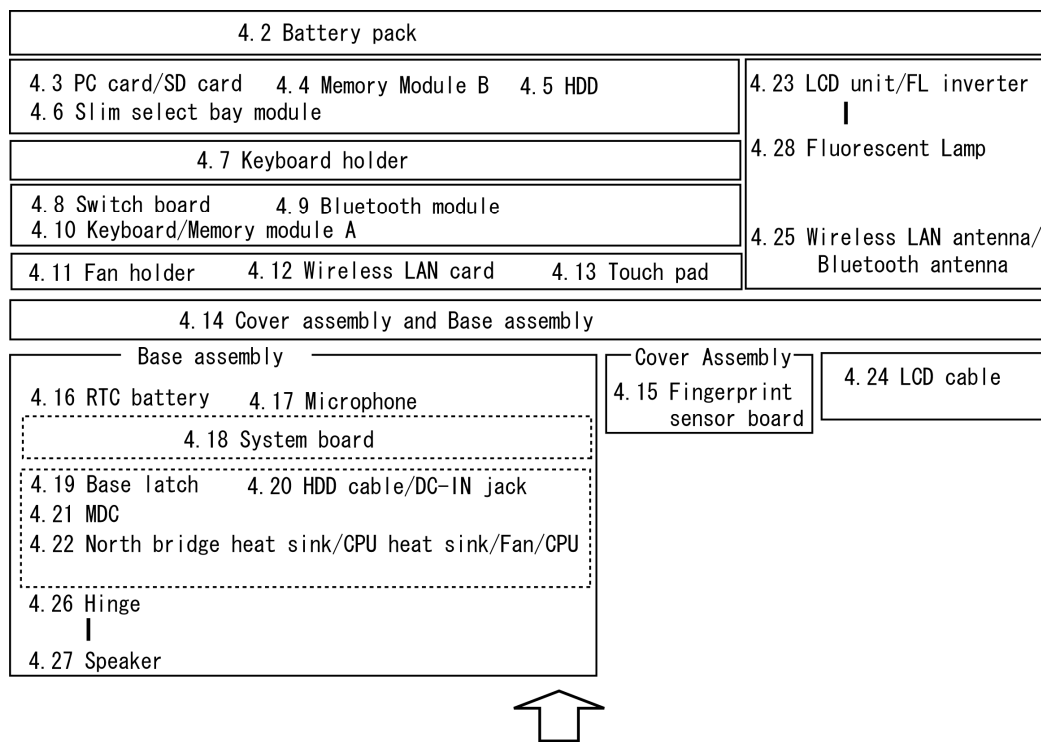
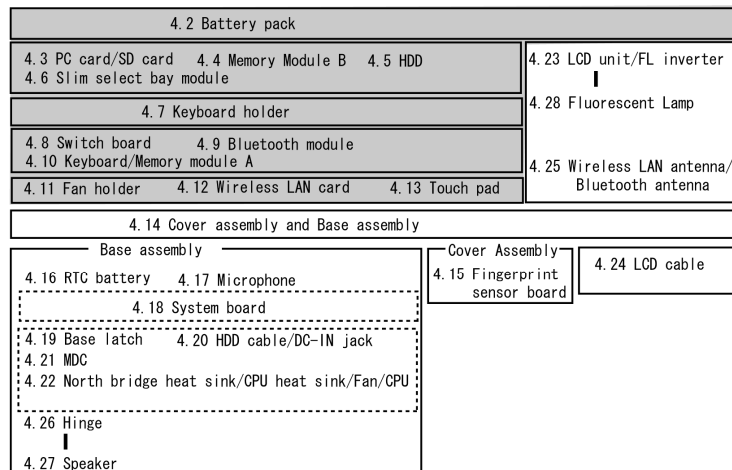


Chart Notation

The chart shows the case for the following example:

- Removing the Cover assembly and Base assembly

All FRUs down to the “4.2 Battery pack” to “4.13 Touch pad” above the 4.14 Cover assembly and Base assembly must be removed.



Safety Precautions

Please read the following safety instructions before disassembling the computer and always follow the instructions while working on the computer.

DANGER: 1) *Always use the genuine battery that is authorized by Toshiba or compatible with the unit. Since other battery packs have different specifications, they may be incompatible with the unit, and may burst or explode.*
Never heat or disassemble the battery pack, as that could cause leakage of alkaline solution. Never throw the battery pack into a fire, as that could cause the battery pack to explode.

2) *The power supply, FL inverter and other components carry high voltages. If you need to turn on the power of a partially disassembled computer to check its operation, be very careful not to touch connectors or components, in order to avoid the risk of electric shock. Also, do not disassemble individual components in first-level maintenance.*

WARNING: 1) *Turn off the power and disconnect the AC adaptor from the power source, to avoid exposure to electric shock.*

2) *Batteries in the computer retain an electrical charge, so there is danger of electrical shock even when the computer is disconnected from an AC power source. Remove any metal jewelry or accessories such as necklaces, bracelets or rings, in order to reduce the risk of electric shock. Never work with wet or damp hands.*

3) *Be careful of edges and corners as these may cut.*

CAUTION: 1) *When you change a component, be sure the replacement component meets the required specifications. Never use foreign parts, to avoid any risk of damage to the computer.*

2) *To avoid any risk of short-circuit, fire or other internal damage, never allow any metal objects such as screws or paper clips to fall into the unit. Be sure to replace screws with the same size as those removed. Make sure all screws are securely fastened. Loose screws can cause short circuits, resulting in heat, smoke or fire.*

3) *Before lifting out an FRU or other component, make sure all cables to the component have been disconnected, in order to reduce the risk of accidental electric shock.*

4) *If you use AC power, be sure to use the cable that came with the computer or one recommended by Toshiba.*

5) *Make sure that all replacement components meet the specifications for the computer and that all cables and connectors are securely fastened, in order to avoid the risk of electric shock.*

6) *Some parts inside the computer, such as the CPU and cooling module, become very hot during operation. Conduct repair work after they have cooled. Be careful around the CPU and cooling module to avoid burns.*

Before You Begin

Take note of the following points before starting work. Always remove the AC adapter and battery pack before commencing any of the procedures. The procedure for removing the battery pack is described in section “4.2. Battery Pack”.

Do not disassemble the computer unless it is operating abnormally.

Use the designated tools.

Ensure that the environment for working on and storing parts does not contain any of the following.

- Dust or dirt
- Static electricity
- Extremely hot, cold, or humid conditions

Perform the diagnostic tests described in Chapter 2 to determine which FRU is the cause of the fault.

Do not perform any unnecessary work. Always work in accordance with the disassembly and re-assembly procedures in this manual.

Keep parts removed from the computer in a safe place away from the computer where they will not be damaged or interfere with your work.

Disassembling requires the removal of a large number of screws. Keep removed screws in a safe place such that you can determine which screws belong to which part.

When re-assembling, ensure that you use the correct screws and fit parts in the correct position. Screw sizes are noted in the text and figures.

As all parts have sharp edges and corners, take care not to cut yourself.

After replacing an FRU, check that the computer and replaced part operate correctly.

Disassembly Procedure

Four main types of cable connector are used.

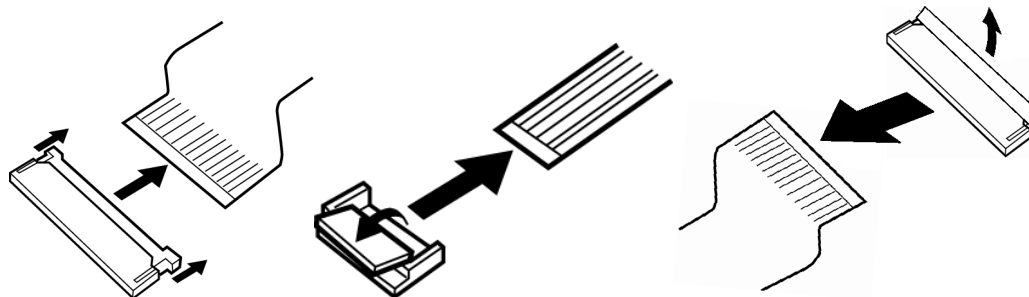
- Pressure plate connector
- Spring connector
- Back flip connector
- Normal pin connector

For pressure plate connectors, slide the pressure plate holding tags on both sides of the plastic pressure plate on the connector and pull the cable out from the connector. When reconnecting the cable to the pressure plate connector, slide the pressure plate holding tags on both sides of the plastic pressure plate on the connector and insert the cable into the connector. Push both tags of the pressure plate such that the cable is fixed in the correct position. Pull the cable to ensure that it is securely connected.

For spring connectors, lift up the stopper frees the cable and allow it to be pulled out. To reconnect, hold the stopper in the up position and insert the cable, then lower the stopper to secure the cable. Pull the cable to ensure that it is securely connected.

For back flip connectors, lift up the flip plate frees the cable and allow it to be pulled out. To reconnect, hold the flip plate in the up position and insert the cable, then lower the flip plate to secure the cable. Pull the cable to ensure that it is securely connected.

Normal pin connectors are used for all other cables. Simply pull out or push in these connectors to disconnect or reconnect.



Pressure plate connector

Spring connector

Back flip connector

Assembly Procedure

After the computer has been disassembled and the part that caused the fault has been repaired or replaced, the computer must be reassembled.

Take note of the following general points when assembling the computer.

- Take your time and follow the instructions carefully. Hurrying the assembly work will only introduce new problems.
- Check that all cables and connectors are securely connected.
- Before fastening FRUs or other parts in place, ensure that no cables are caught on screws or the FRU.
- Check that all latches are securely closed.
- Ensure that you have installed all FRUs correctly and do not have any screws left over. Using an incorrect screw may damage the thread or screw head and result in the FRU not being securely fastened in place.

After installing FRUs, check that the computer operates correctly.

Tools and Equipment

For your safety and the safety of the people around you, it is important that you use Electrostatic Discharge (ESD) equipment. Correctly utilizing of the equipment increases the percentage of successful repairs and saves on the cost of damaged or destroyed parts. The following equipment is required for disassembly and assembly.

- One Philips screwdriver with type 0 bit (for S-THIN HEAD screws)
- One Philips screwdriver with type 1 bit (for screws other than above)
- Tweezers (for lifting screws)
- ESD mats (lay on work table or floor)
- An ESD wrist strap and heel grounder
- Anti-static carpet or flooring
- A pair of needle-nose pliers
- Air-ionizers in highly static sensitive areas
- Antenna coaxial cable disconnecter

Screw Tightening Torque

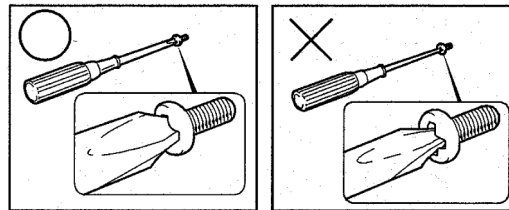
Use the following torque when tightening screws.

CAUTION: Overtightening may damage screws or parts. Undertightening may allow screws to loosen (and possibly fall out) causing a short circuit or other damage.

NOTE: To tighten screws quickly and accurately, an electric screwdriver is recommended.

- M2 (2mm) 0.167 N•m (1.7 kgf•cm)
- M2.5 (2.5mm) 0.294 N•m (3.0 kgf•cm)
- M3 (3mm) 0.549 N•m (5.6 kgf•cm)

NOTE: To prevent damage to THIN HEAD screws, use type 0 bit philips screwdriver. Use, however, the PH point size "1" screwdriver for screws fixing the memory slot cover and keyboard. Press along the axis of the screwdriver while turning the screw. This is because the contact area between the screw and driver is less than for a pan head screw (standard pan-shaped screw head).



Grip Color

Some screws have a colored grip area to help you determine the length of the screw.

- Even numbered length screws: Brown
- Odd numbered length screws: White
- Special length screw: Blue

“Special length screw” means screws whose length is indicated in an integral number to the first decimal places such as 2.5 mm, 2.6 mm and so on.



Screw Notation

To make maintenance of the computer easier, markings of the kinds of the screws including the types and lengths of the screws are indicated on the computer body.

Format:

Screw type + Screw length (mm)

Screw type

- B: Bind screw
- F: Flat head screw
- S: Super thin head screw
- T: Tapping screw
- U: Other screws (Unique screws: pan head, stud, etc.)

Example: B6... 6mm BIND screw

4.2 Battery pack

Removing the battery pack

The following describes the procedure for removing the battery pack. (See Figure 4-1.)

CAUTION: Take care not to short circuit the terminals when removing the battery pack. Similarly, do not drop, knock, scratch, disassemble, twist, or bend the battery pack.

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all other external devices from the computer.
3. Turn the computer upside down.
4. Slide the **battery lock** toward the arrow pointing.
5. Pull out the **battery pack** while sliding the **battery latch** toward the arrow pointing.

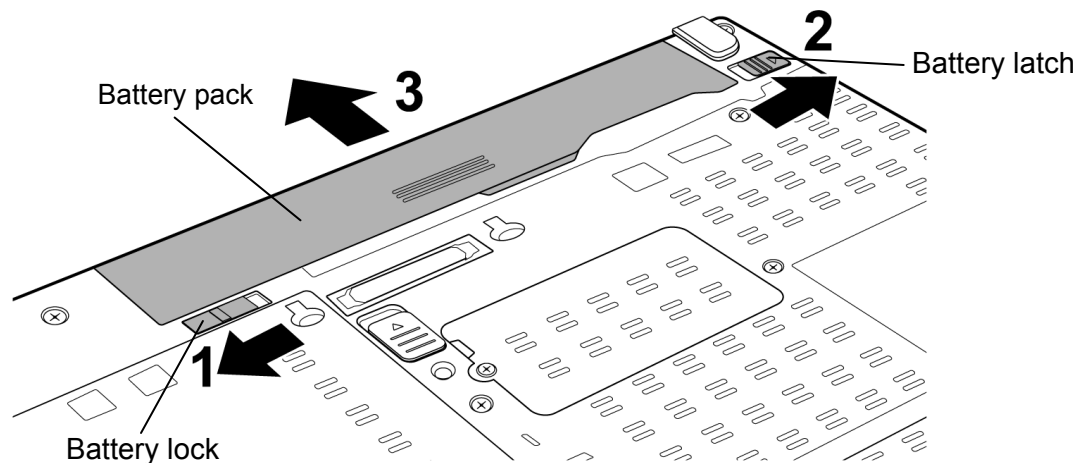


Figure 4-1 Removing the battery pack

NOTE: Dispose of the used battery pack in accordance with the laws and ordinances of your local authority.

Installing the battery pack

The following describes the procedure for installing the battery pack. (See Figure 4-1.)

CAUTION: *There is a danger that the lithium ion battery pack may explode if not fitted, operated, handled, or disposed correctly. Dispose always the used batteries pack in accordance with the laws and ordinances of your local authority. Use only the batteries approved by Toshiba.*

NOTE: *Check visually the battery terminals and clean off any dirt with a dry cloth.*

1. Turn off the power of the computer.
2. Disconnect the AC adapter and all other external devices from the computer.
3. Install the **battery pack** into the battery slot. Make sure the battery pack is installed securely.

4.3 PC card/SD card

4.3.1 PC Card

Removing the PC card

The following describes the procedure for removing the PC card. (See Figure 4-2.)

NOTE: Insert or remove the PC card in accordance with any instructions in the PC card manual or the manuals of this computer.

1. Turn the computer upside down.
2. Push the **eject button**. It will pop out. Then press the eject button again to eject the PC card.
3. Grasp the **PC card** and remove it.
4. Push the **eject button** until it is locked.

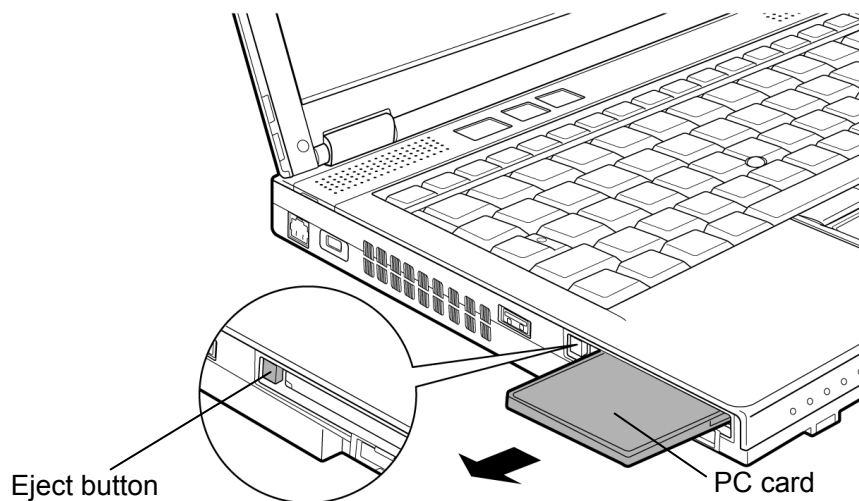


Figure 4-2 Removing the PC card

Installing the PC card

The following describes the procedure for installing the PC card. (See Figure 4-2.)

1. Make sure the eject button does not stick out.
2. Insert the **PC card** carefully and make sure a firm connection.

4.3.2 SD card

Removing the SD card

The following describes the procedure for removing the SD card. (See Figure 4-3.)

NOTE: Insert or remove the SD card in accordance with any instructions in the SD card manual or the manuals of the computer system you are using.

1. Push the **SD card**. It will pop out partly, so pull out the card.

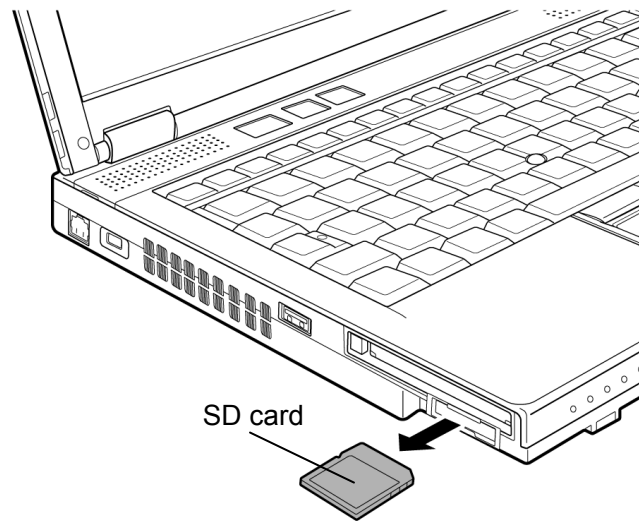


Figure 4-3 Removing the SD card

Installing the SD card

The following describes the procedure for installing the SD card. (See Figure 4-3.)

1. Insert the **SD card** and press it until it securely connected.

4.4 Memory module B

CAUTION: The power must be turned off when you remove the memory module. Removing the memory module with the power on risks damaging the module or the computer itself.

Do not touch the memory module terminals. Any dirt on the terminals may cause memory access problems.

Never press hard or bend the memory module.

Removing the memory module B

To remove the memory module B, make sure the computer is in boot mode and powered off. Then perform the following procedure. (See Figure 4-4 and 4-5.)

1. Loosen the **screw** and remove the **memory slot cover**.

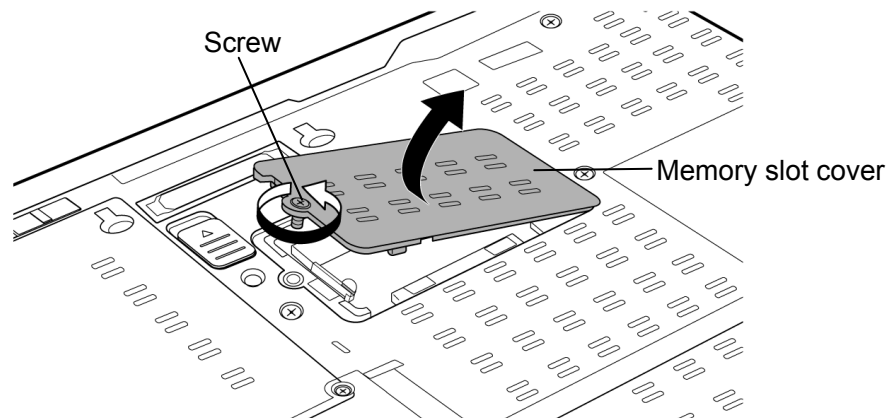


Figure 4-4 Removing the memory slot cover

2. Open the left and right **latches** outside and remove the **memory module B**.

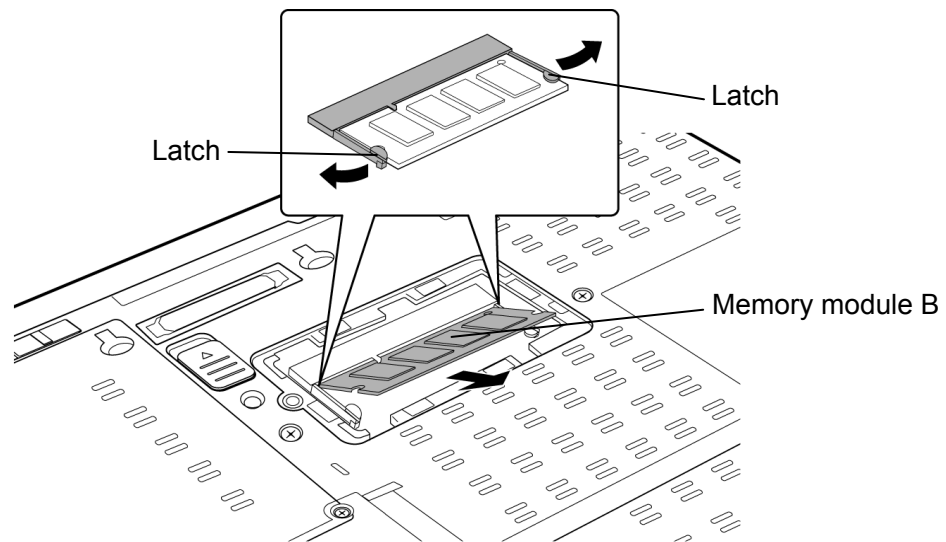


Figure 4-5 Removing the memory module B

Installing the memory module B

To install the memory module B, make sure the computer is in boot mode and powered off. Then perform the following procedure. (See Figure 4-4 and 4-5.)

1. Insert the **memory module B** into the connector slantwise (the terminal side first) and press it to connect firmly.

CAUTION: *The power must be turned off when you insert the memory module. Inserting the memory module with the power on risks damaging the module or the computer itself.*

Never press hard or bend the memory module.

After installing the memory module, confirm that the memory module is fixed with the left and right latches.

2. Install the **memory slot cover** and secure it with the **screw**.

4.5 HDD

Removing the HDD

The following describes the procedure for removing the HDD. (See Figure 4-6 to 4-8.)

CAUTION: Take care not to press on the top or bottom of the HDD. Pressure may cause data loss or damage to the HDD.

1. Remove the following screws and HDD slot cover.

- M2.5×16B FLAT HEAD screw ×1
- M2.5×8B FLAT HEAD screw ×1

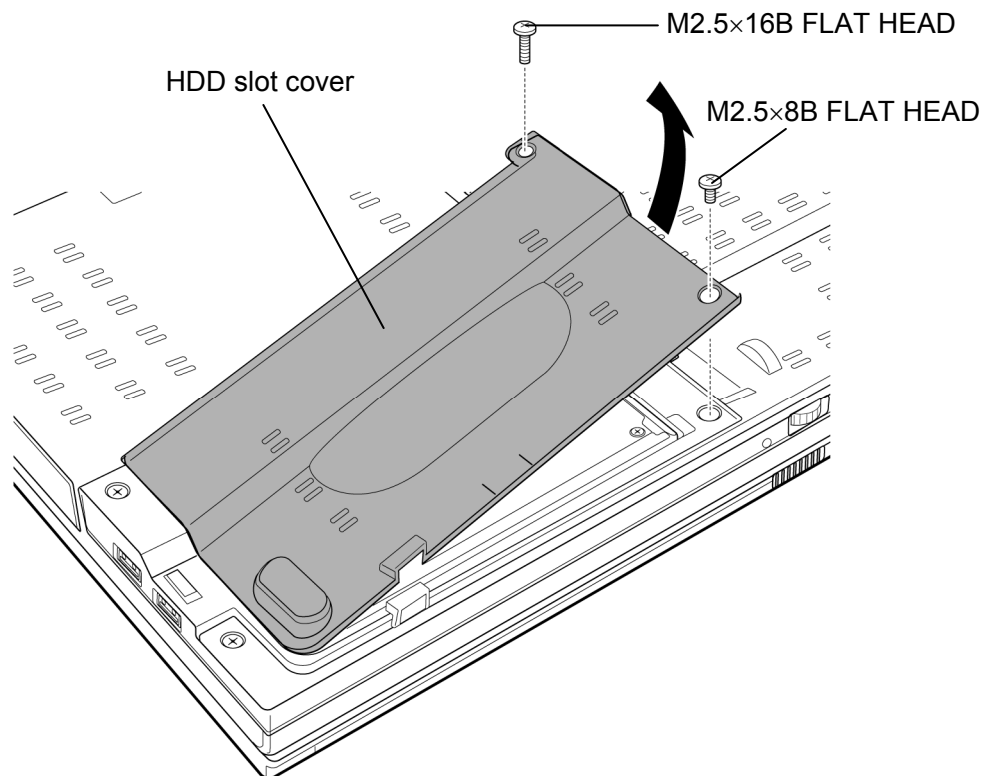


Figure 4-6 Removing the HDD slot cover

2. Raise the HDD assembly with holding the **tab** from the slot and pull out the **HDD assembly** from the connector of the **HDD cable**.

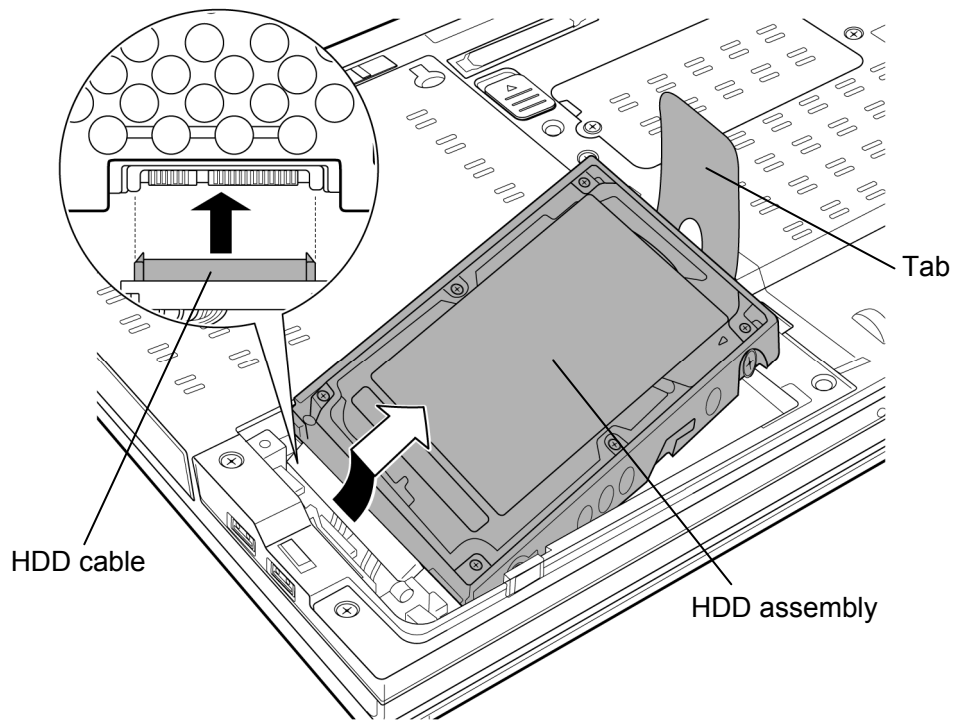


Figure 4-7 Removing the HDD assembly

- Place the HDD assembly on a flat surface and remove the following **screws** fixing the HDD holder.

- M3×4C FLAT HEAD screw ×4

- Separate the **HDD holder** and **HDD**.

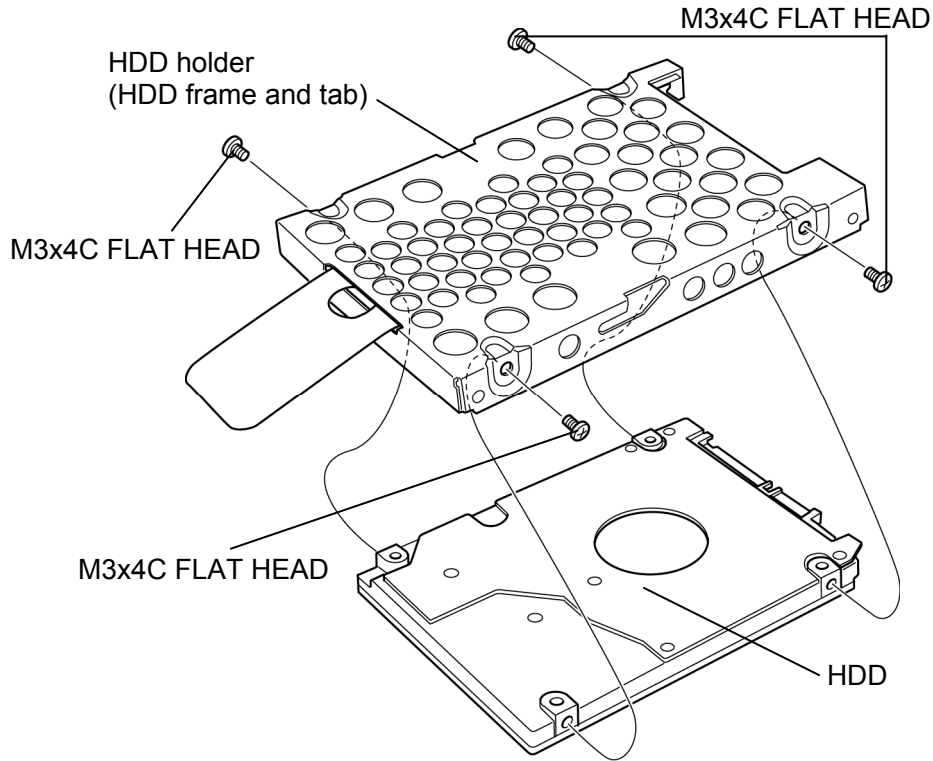


Figure 4-8 Removing the HDD

Installing the HDD

The following describes the procedure for installing the HDD. (See Figure 4-6 to 4-8.)

CAUTION: Do not hold the HDD by its top and bottom face. It may damage the HDD.

1. Seat the **HDD** in the **HDD holder** and secure them with the following **screws**.

- M3×4C FLAT HEAD screw ×4

CAUTION: Do not apply pressure to the middle of the HDD assembly. It may damage the HDD assembly. Hold the HDD assembly by its corners.

2. Set the connector of the **HDD cable** upward and connect the **HDD assembly** to the connector. Press the HDD assembly to ensure a firm connection.

3. Set the **HDD assembly** into the slot.

4. Seat the **HDD slot cover** and secure it with the following **screws**.

- M2.5×16B FLAT HEAD screw ×1
- M2.5×8B FLAT HEAD screw ×1

4.6 Slim select bay module

Removing the slim select bay module

The following describes the procedure for removing the slim select bay module. (See Figure 4-9 and 4-10.)

The explanation and figure shown below are the optical disk drive removing/installing.

CAUTION: Do not put fingers in the slot for the slim select bay module. It may cause injury.

1. Remove the following **screw** securing the **latch** and drive the removed screw into the screw hole. (The slim select bay is unlocked.)
 - M2.5×4B FLAT HEAD screw ×1
2. While sliding the **latch** toward the arrow direction in the Figure 4-9 and pull out the **slim select bay module** while holding the **hook** to disconnect it from the connector of the system board.

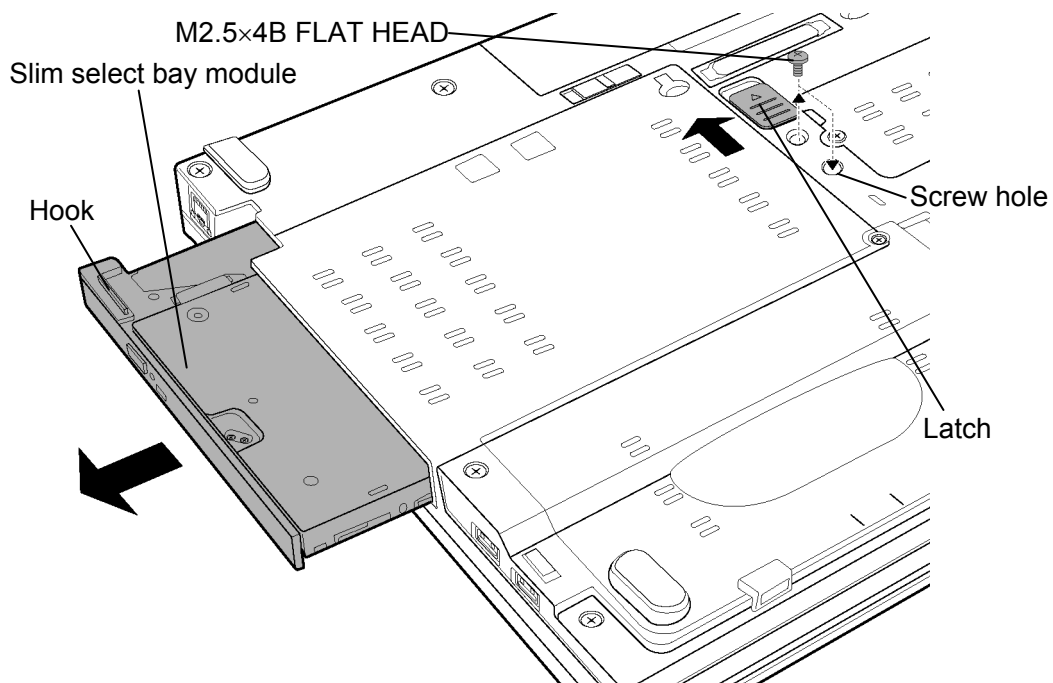


Figure 4-9 Removing the slim select bay module

3. Remove the following **screws, connector cover** and **connector** from the optical drive assembly.

- M2×6C BIND screw ×2

4. Remove the following **screw** and **connector base** from the optical drive assembly.

- M2×2.8C S-THIN HEAD screw ×1

5. Remove the following **screws** and **ODD side assembly** from the optical drive assembly

- M2×6C BIND screw ×1

- M2×22C BIND screw ×1

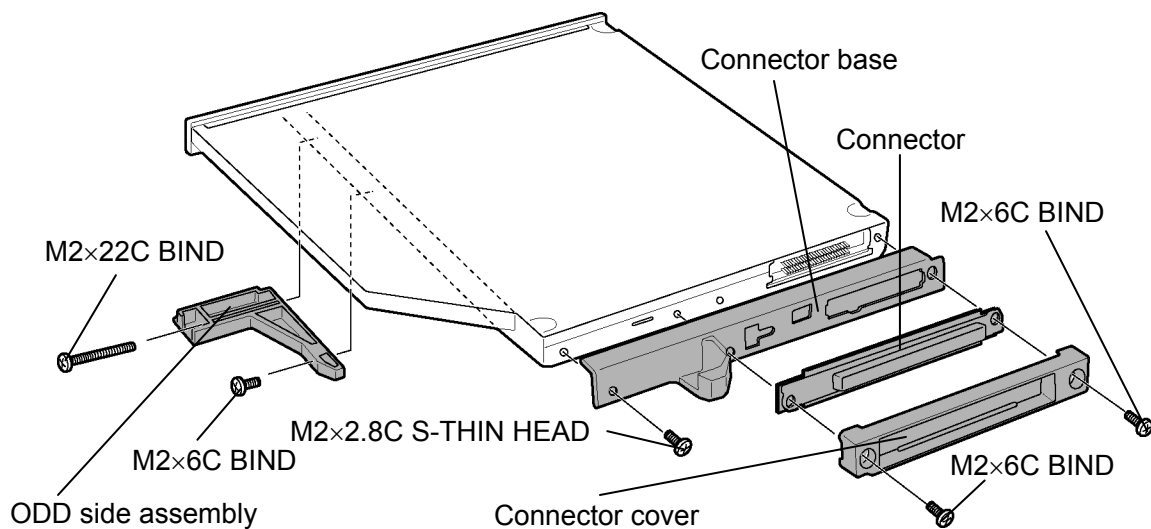


Figure 4-10 Detaching the optical disk drive assembly

Installing the slim select bay module

The following describes the procedure for installing the slim select bay module. (See Figure 4-9 and 4-10.)

1. Install the **ODD side assembly** to the optical drive assembly and secure it with the following **screws**.
 - M2×6C BIND screw ×1
 - M2×22C BIND screw ×1
2. Install the **connector base** to the optical drive assembly and secure it with the following **screw**.
 - M2×2.8C S-THIN HEAD screw ×1
3. Install the **connector cover** and **connector** to the optical drive assembly and secure it with the following **screws**.
 - M2×6C BIND screw ×2
4. Insert the **slim select bay module** into the computer to connect it to the connector on the system board. Press to ensure a firm connection.
5. Remove the following **screw** from the screw hole. Then secure the latch with the **removed screw**. (The slim select bay is locked.)
 - M2.5×4B FLAT HEAD screw ×1

4.7 Keyboard holder

Removing the Keyboard holder

The following describes the procedure for removing the keyboard holder. (See Figure 4-11.)

1. Open the display and make it flat.
2. Insert your fingers into the **slots** on both sides and remove the **keyboard holder**.

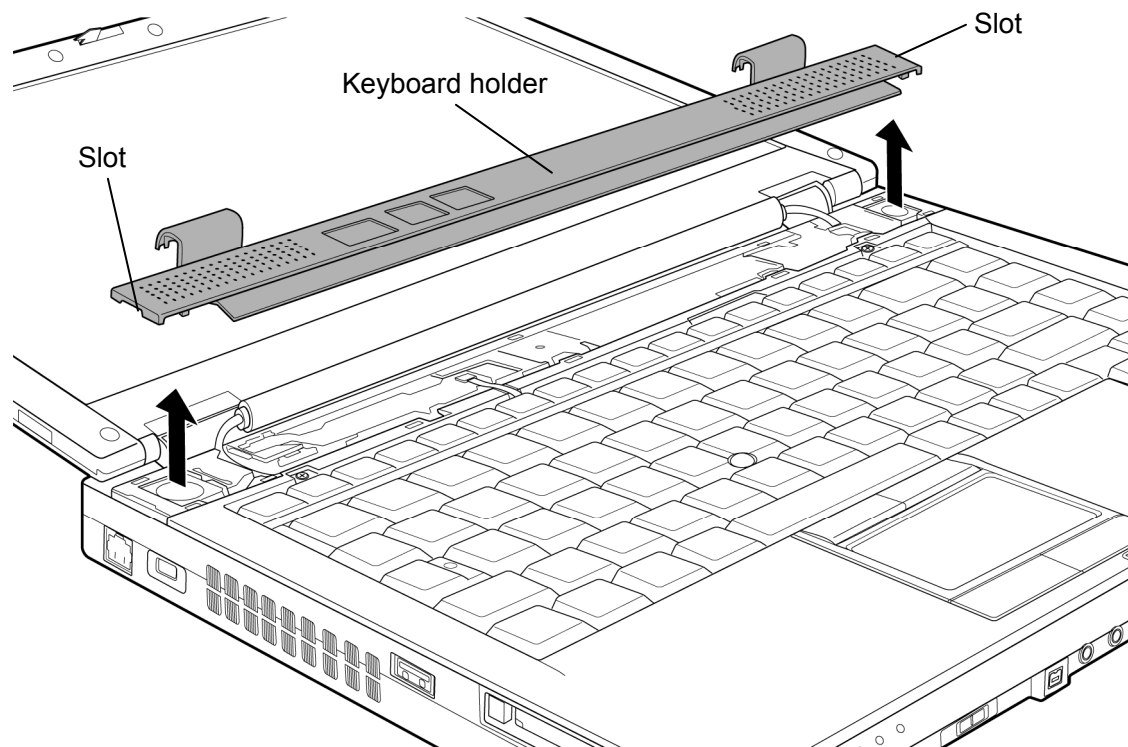


Figure 4-11 Removing the keyboard holder

Installing the Keyboard holder

The following describes the procedure for installing the keyboard holder. (See Figure 4-11.)

1. Install the **keyboard holder** while engaging the latches.

4.8 Switch board

Removing the Switch board

The following describes the procedure for removing the switch board. (See Figure 4-12.)

1. Disconnect the **switch cable** from the connector on the switch board.
2. Push the **hook** down and remove the **switch board** from the slot while sliding it as shown in the figure below.

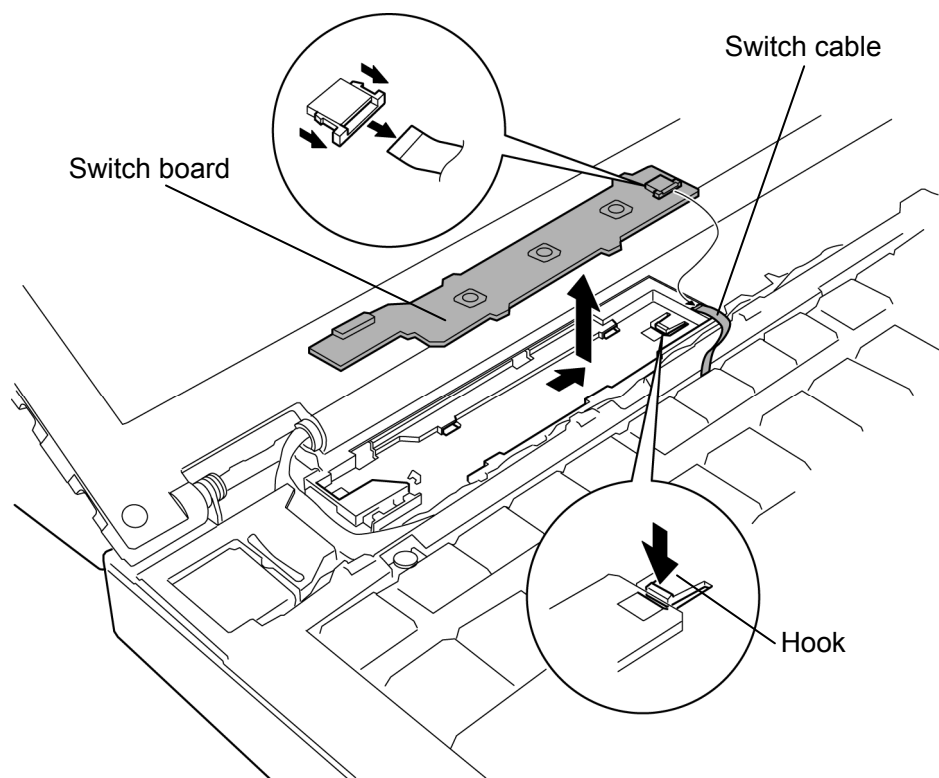


Figure 4-12 Removing the switch board

Installing the Switch board

The following describes the procedure for installing the switch board. (See Figure 4-12.)

1. Install the **switch board** to the slot while sliding it in the opposite direction at removing.
2. Connect the **switch cable** to the connector on the switch board.

4.9 Bluetooth module

Removing the Bluetooth module

The following describes the procedure for removing the Bluetooth module. (See Figure 4-13.)

1. Disconnect the **Bluetooth cable** and **Bluetooth antenna cable** from the connector on the Bluetooth module.
2. Push the **latch** and remove the **Bluetooth module** from the slot.

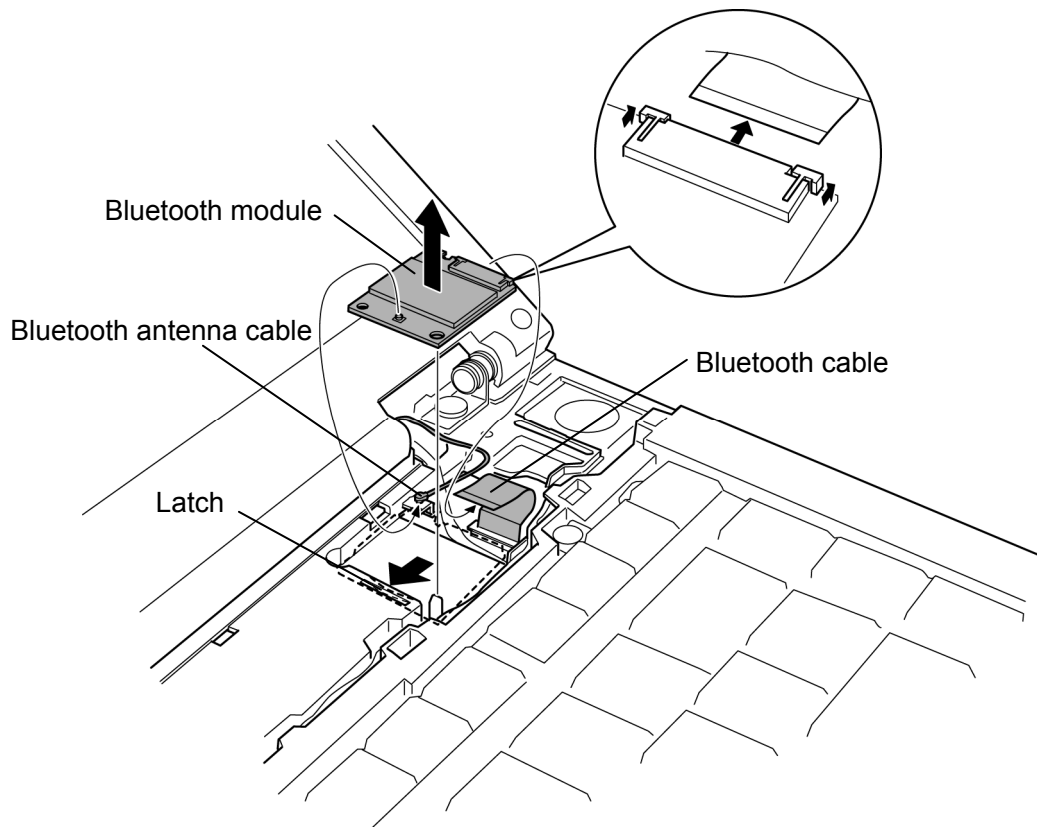


Figure4-13 Removing the Bluetooth module

Installing the Bluetooth module

The following describes the procedure for installing the Bluetooth module. (See Figure 4-13.)

1. Install the **Bluetooth module** into the slot while engaging the **latch**.
2. Connect the **Bluetooth cable** and **Bluetooth antenna cable** to the connector on the Bluetooth module.

4.10 Keyboard/Memory module A

Removing the keyboard/memory module A

The following describes the procedure for removing the keyboard/memory module A. (See Figure 4-14 to 4-17.)

1. Remove the following **screws** and turn the **keyboard** face down on the palm rest.

- M2.5×4B FLAT HEAD screw ×2

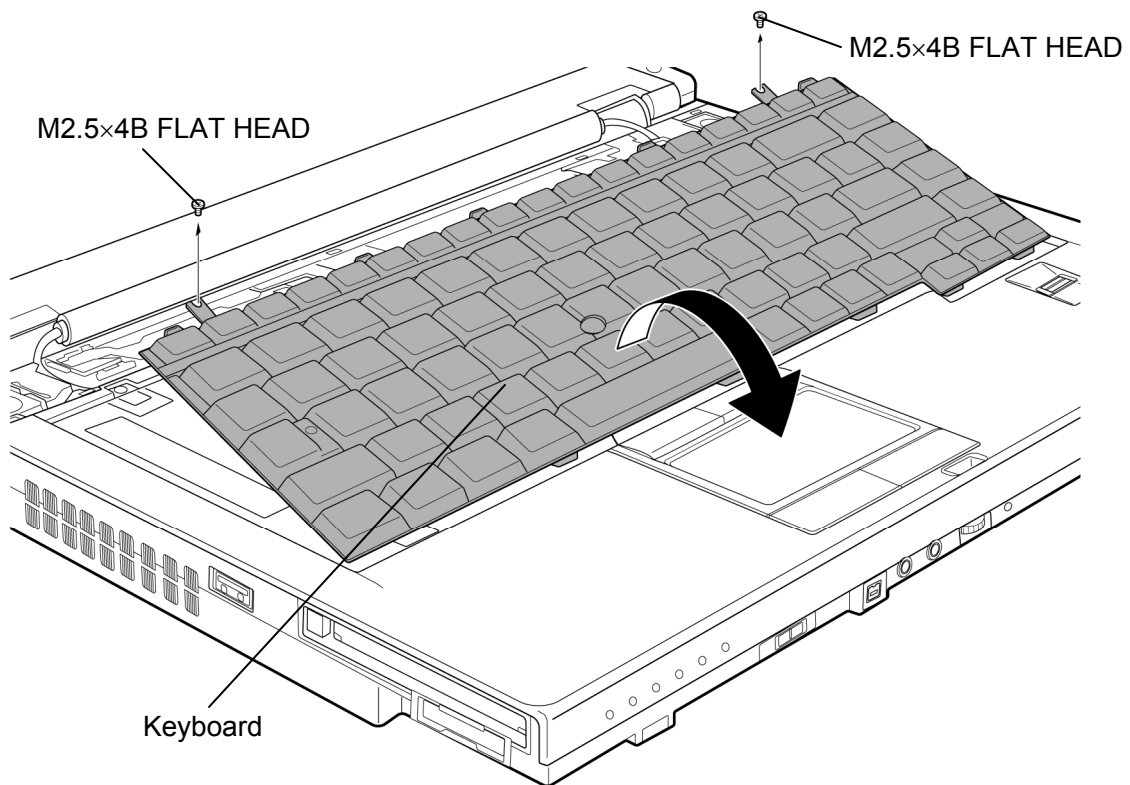


Figure 4-14 Removing the keyboard (1)

2. Remove the following screws and memory slot cover.

- M2.5×8B FLAT HEAD screw ×2

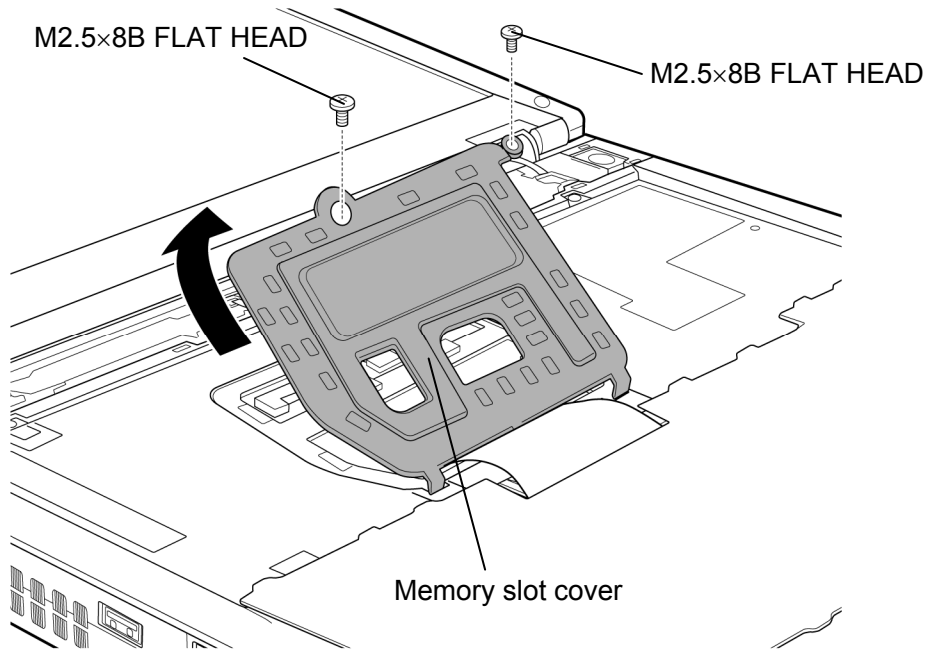


Figure 4-15 Removing the memory slot cover

CAUTION: The power must be turned off when you remove the memory module. Removing the memory module with the power on risks damaging the module or the computer itself.

Do not touch the memory module terminals. Any dirt on the terminals may cause memory access problems.

Never press hard or bend the memory module.

3. Open the left and right **latches** outside and remove the **memory module A**.

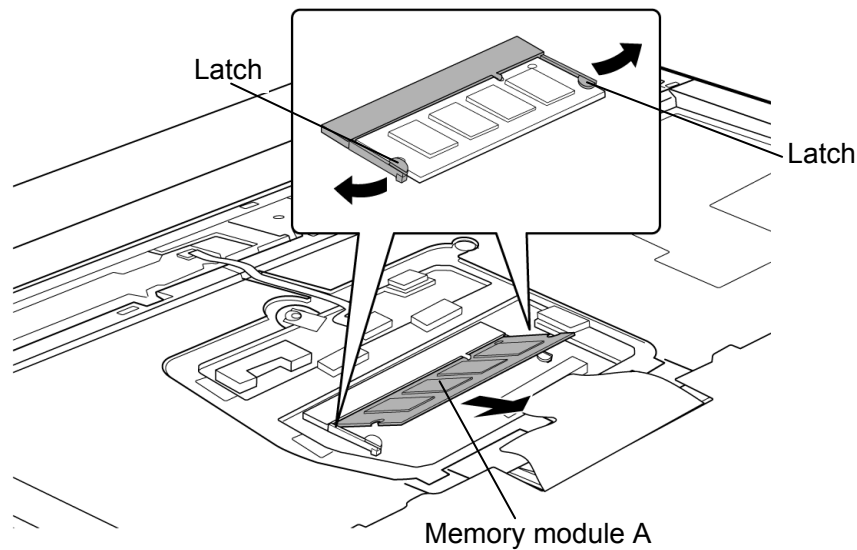


Figure 4-16 Removing the memory module A

4. Disconnect the **keyboard cable** from the connector **CN3230** on the system board and remove the **keyboard**.

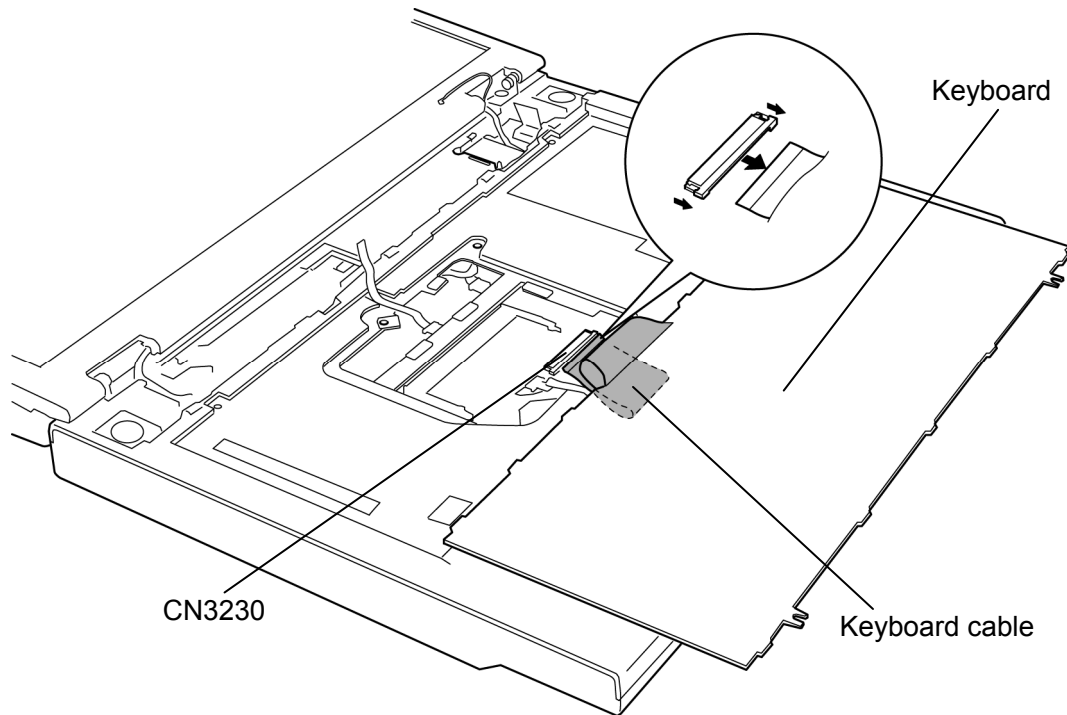


Figure 4-17 Removing the keyboard (2)

Installing the keyboard/Memory module A

The following describes the procedure for installing the keyboard/memory module A. (See Figure 4-14 to 4-17.)

1. Place the keyboard face down on the palm rest.
2. Connect the **keyboard cable** to the connector **CN3230** on the system board.

CAUTION: *Extra portion of the keyboard cable must be put under the palm rest.*

3. Insert the **memory module A** into the connector slantwise (the terminal side first) and press it to connect firmly.

CAUTION: *The power must be turned off when you insert the memory module. Inserting the memory module with the power on risks damaging the module or the computer itself.*

Never press hard or bend the memory module.

After installing the memory module, confirm that the memory module is fixed with the left and right latches.

4. Install the **memory slot cover** and secure it with the following **screws**.

- M2.5×8B FLAT HEAD screw ×2

5. Turn the **keyboard** face up and set it in place.

6. Secure the **keyboard** with the following **screws**.

- M2.5×4B FLAT HEAD screw ×2

4.11 Fan holder

NOTE: When repairing the PC, be sure to clean the fan holder and cooling fin with a vacuum cleaner and cotton sticks, and remove dusts with tweezers.

Removing the fan holder

The following describes the procedure for removing the fan holder. (See Figure 4-18.)

1. Peel off the **insulator** that prevents a waterdrop from entering the computer and remove the **fan holder** from the slot.

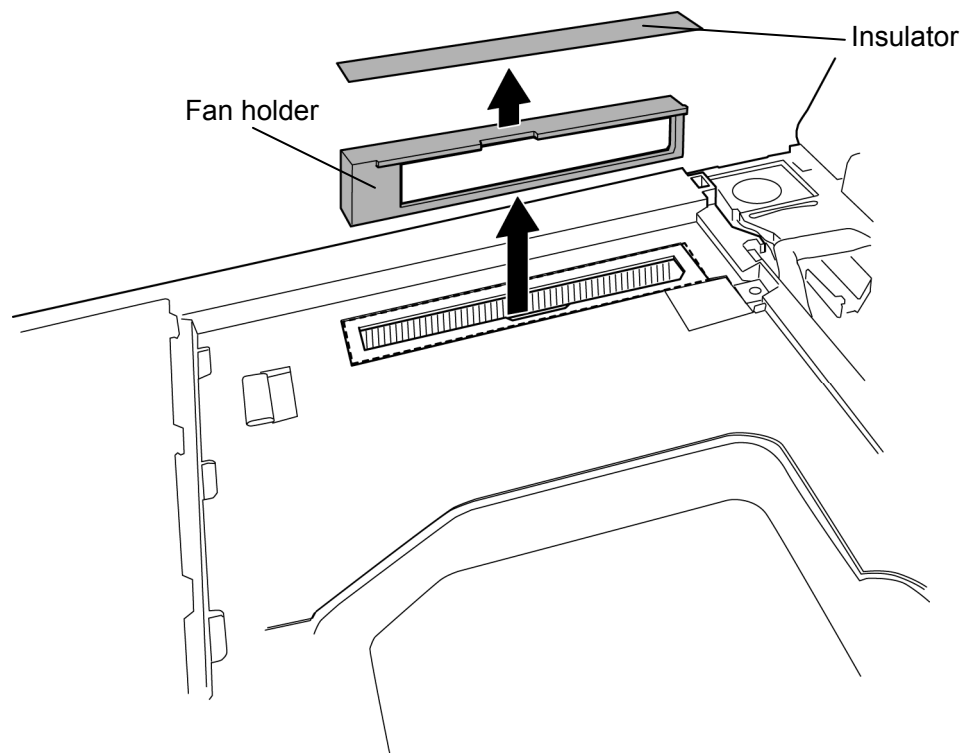


Figure 4-18 Removing the fan holder

Installing the fan holder

The following describes the procedure for installing the fan holder. (See Figure 4-18.)

1. Install the **fan holder** into the slot and stick a new **insulator** that prevents a waterdrop from entering the computer in place.

NOTE: Do not reuse the removed insulator.

4.12 Wireless LAN card

Removing the Wireless LAN card

The following describes the procedure for removing the wireless LAN card. (See Figure 4-19 and 4-20.)

CAUTION: Do not try to remove the wireless LAN card with the computer turned on. It may cause damages to the computer or the wireless LAN card. Do not touch the connectors on the wireless LAN card on the computer. Debris on the connectors may cause the wireless LAN card access problems.

1. Peel off the **insulator** that prevents a waterdrop from entering the computer.
2. Remove the following **screws**.
 - M2×4B BIND screw ×2
3. Disconnect the **wireless LAN antenna cables** (black, white and gray) from the wireless LAN card using an antenna coaxial cable disconnecter.
4. Disconnect the **wireless LAN card** from the connector on the system board.

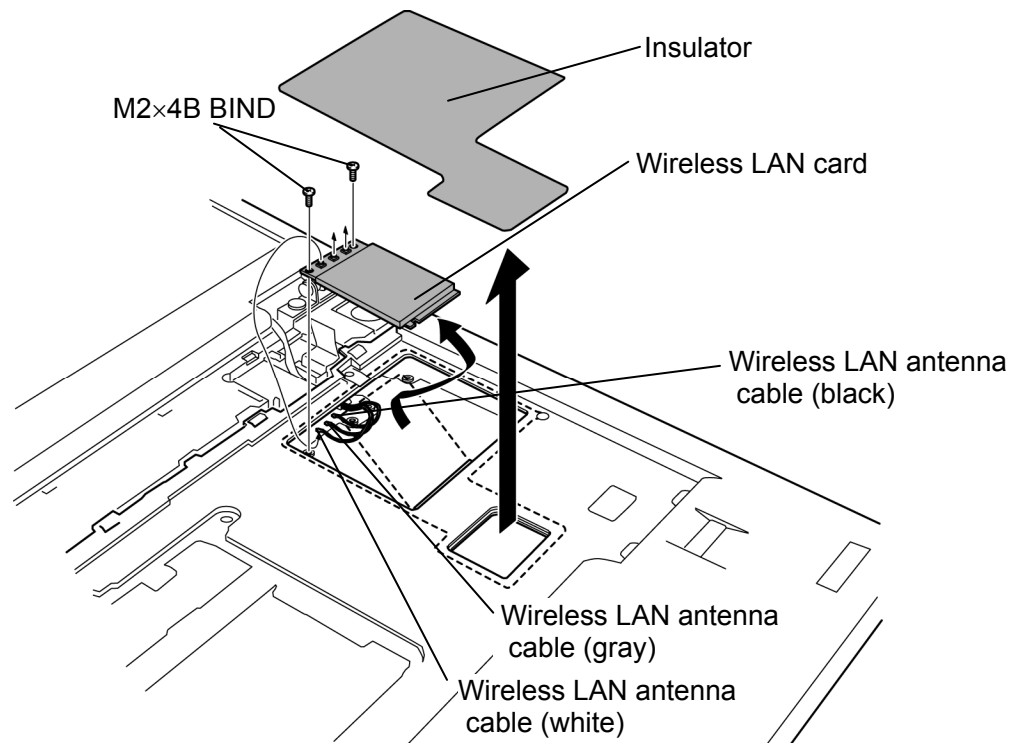


Figure 4-19 Removing the wireless LAN card

5. Pull out the **wireless LAN antenna cables** (black, white and gray) from the hole of the cover assembly.

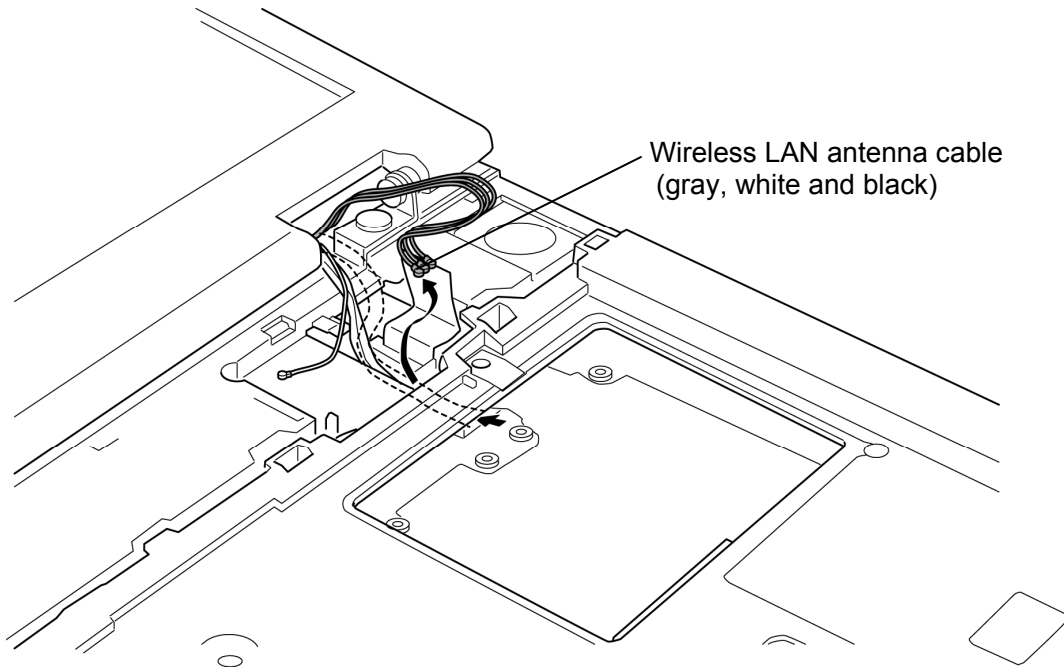


Figure 4-20 Pulling the wireless LAN cables

Installing the Wireless LAN card

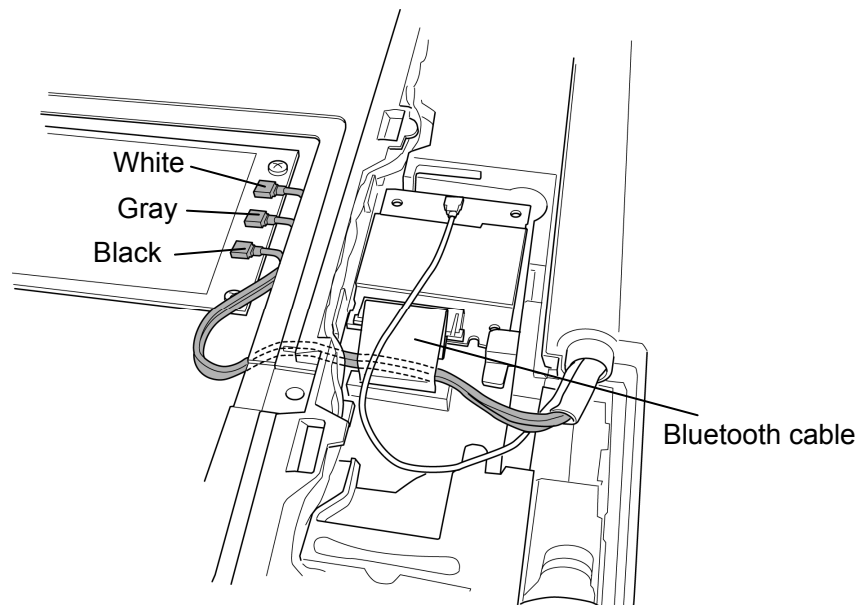
The following describes the procedure for installing the wireless LAN card. (See Figure 4-19 and 4-20.)

CAUTION: Be sure to switch the computer off before installing the wireless LAN card. Otherwise, the computer or the wireless LAN card may be damaged.

1. Arrange the **wireless LAN antenna cables** (black, white and gray) through the hole of the cover assembly.
2. Insert the **wireless LAN card** to the connector on the system board slantwise and press it to connect firmly.
3. Connect the **wireless LAN antenna cables** (white: 1, black: 2, gray: 3) to the connectors on the wireless LAN card.

NOTE: Connector 3 (for the gray cable) is placed on the center.

Pass the wireless antenna cables under the Bluetooth cable.



4. Secure the wireless LAN card with the following **screws**.
 - M2×4B BIND screw ×2
5. Stick a new **insulator** that prevents a waterdrop from entering the computer.

NOTE: Do not reuse the removed insulator.

4.13 Touch pad

Removing the Touch pad

The following describes the procedure for removing the touch pad. (See Figure 4-21 to 4-23.)

1. Lift the **tip portions** up first and remove the **touch pad cover** while releasing **latches**.

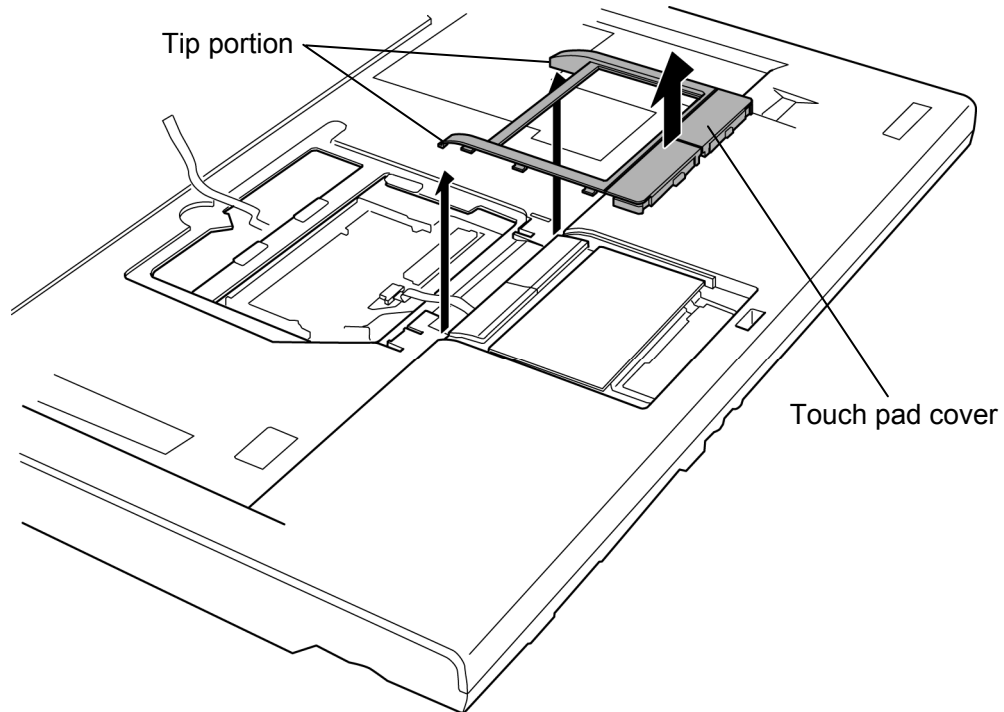


Figure 4-21 Removing the touch pad cover

2. Disconnect the **touch pad cable** from the connector **CN3240** on the system board and remove the **touch pad** from the slot. (The touch pad is adhered by the double-sided tape to the slot.)

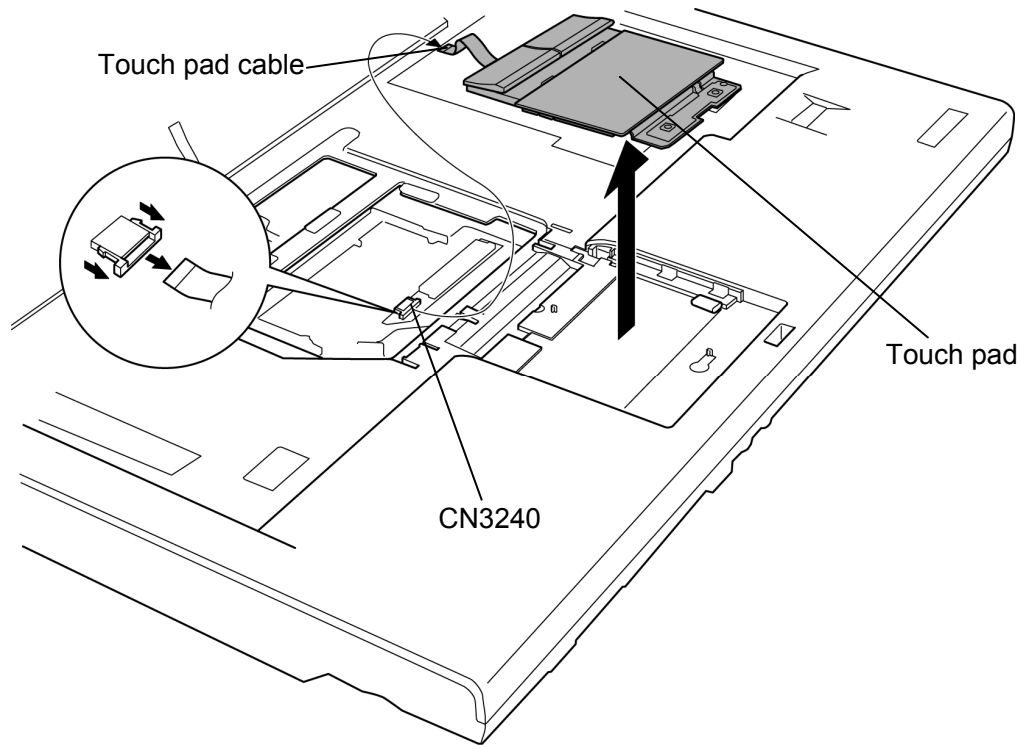


Figure 4-22 Removing the touch pad

3. Peel off the **glass tape** and disconnect the **touch pad cable** from the connector on the touch pad.

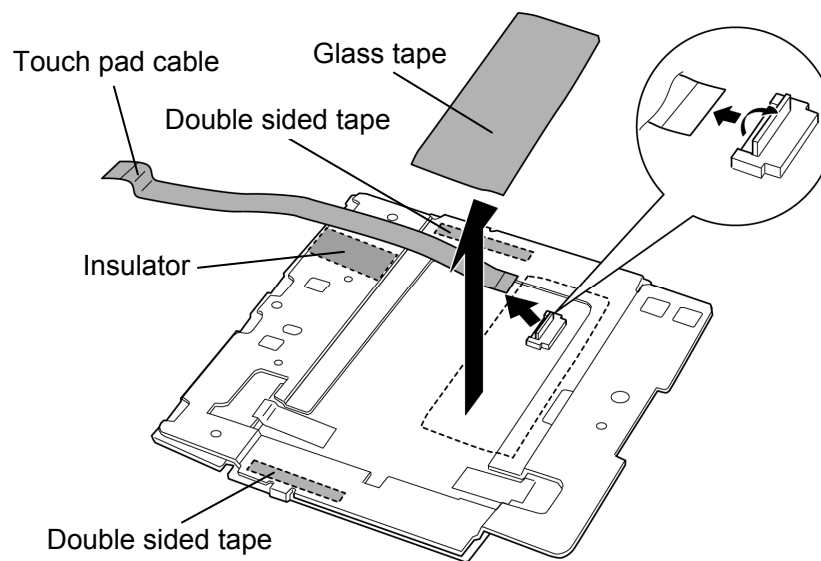


Figure 4-23 Removing the touch pad cable

Installing the Touch pad

The following describes the procedure for installing the touch pad. (See Figure 4-21 to 4-23.)

1. Connect the **touch pad cable** to the connector on the touch pad.
2. Stick the **glass tape** in place.

NOTE: *When installing a new touch pad, reuse the **double-sided tape** and **insulator** and stick them in place. If the adhesive strength of the double-sided tape and insulator on the touch pad is weak, replace it (them) with a new one.*

3. Install the **touch pad** in place.
4. Connect the **touch pad cable** to the connector **CN3240** on the system board.
5. Install the **touch pad cover** while engaging the **latches**.

4.14 Cover assembly and Base assembly

Removing the cover assembly and base assembly

The following describes the procedure for removing the cover assembly and base assembly. (See Figure 4-24 and 4-25.)

1. Close the display and turn over the computer.
2. Remove the following screws.
 - M2.5×8B FLAT HEAD screw ×3 (“8” in the figure below)
 - M2.5×16B FLAT HEAD screw ×6 (“16” in the figure below)

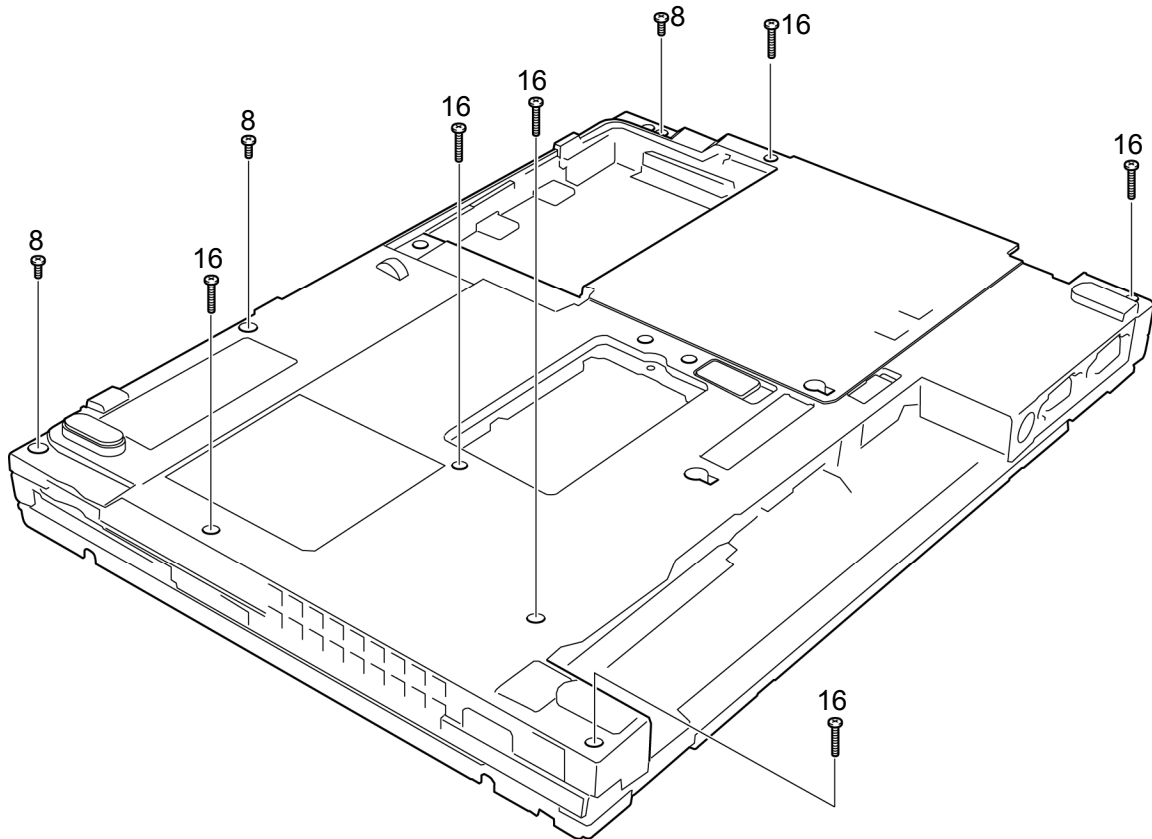


Figure 4-24 Removing the cover assembly and base assembly (1)

3. Turn over the computer and open the display.
4. Disconnect the **LCD cable**, **speaker cable**, **switch cable** and **finger print sensor cable** from the connector **CN5000**, **CN6170**, **CN9500** and **CN9550** on the system board.
5. Remove the following screws.
 - M2×4B BIND screw ×1
 - M2.5×8B FLAT HEAD screw ×1
6. Separate the **cover assembly** and **base assembly**.

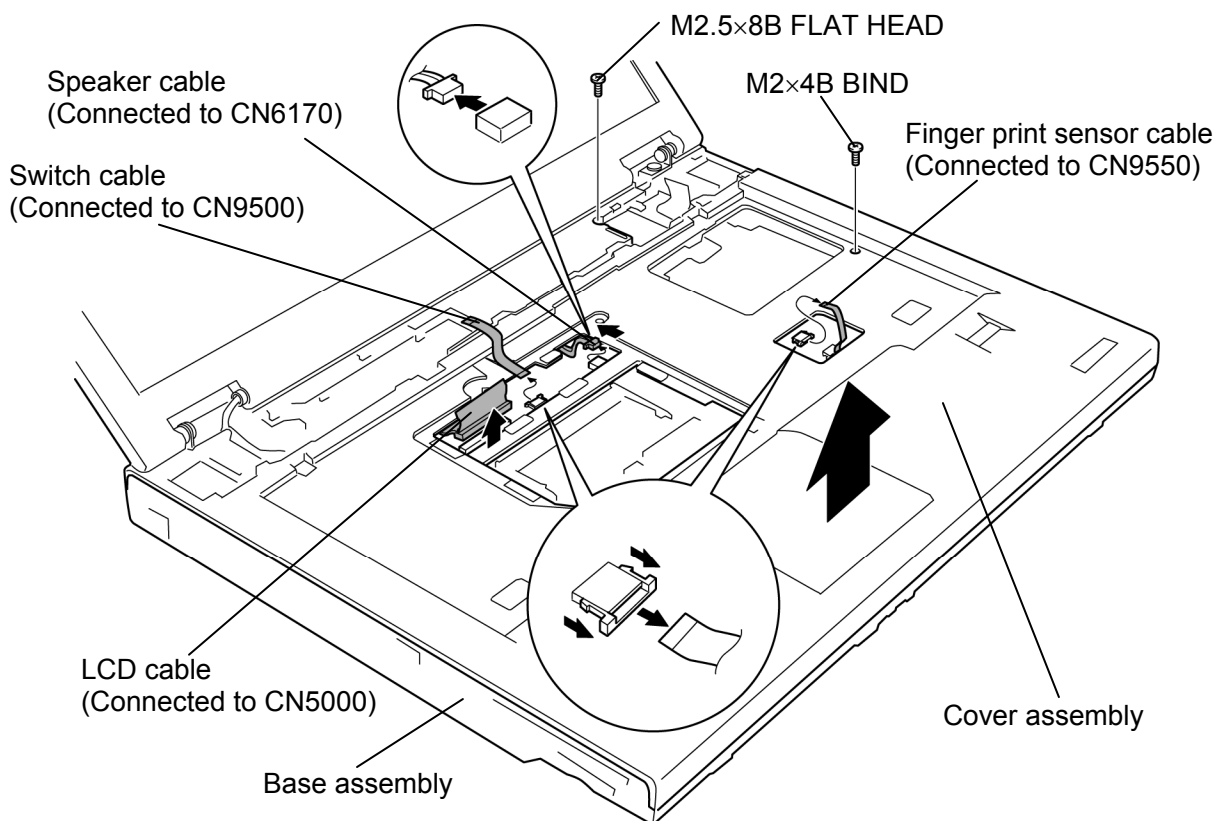


Figure 4-25 Removing the cover assembly and base assembly (2)

Installing the Cover assembly and Base assembly

The following describes the procedure for installing the cover assembly and base assembly. (See Figure 4-24 and 4-25.)

1. Install the **cover assembly** on the **base assembly**.
2. Connect the **LCD cable, speaker cable, switch cable** and **finger print sensor cable** to the connector **CN5000, CN6170, CN9500** and **CN9550** on the system board.
3. Secure the cover assembly and base assembly with the following **screws**.
 - M2×4B BIND screw ×1
 - M2.5×8B FLAT HEAD screw ×1
4. Close the display and turn over the computer.
5. Secure the cover assembly and base assembly with the following **screws**.
 - M2.5×8B FLAT HEAD screw ×3 (“8” in the figure 4-24)
 - M2.5×16B FLAT HEAD screw ×6 (“16” in the figure 4-24)

4.15 Fingerprint sensor board

Removing the Fingerprint sensor board

The following describes the procedure for removing the fingerprint sensor board. (See Figure 4-26 and 4-27.)

1. Push the **hook** down and remove the **fingerprint sensor board hold plate** while sliding it in the direction of the arrow in the figure below.
2. Peel off the **glass tape**.

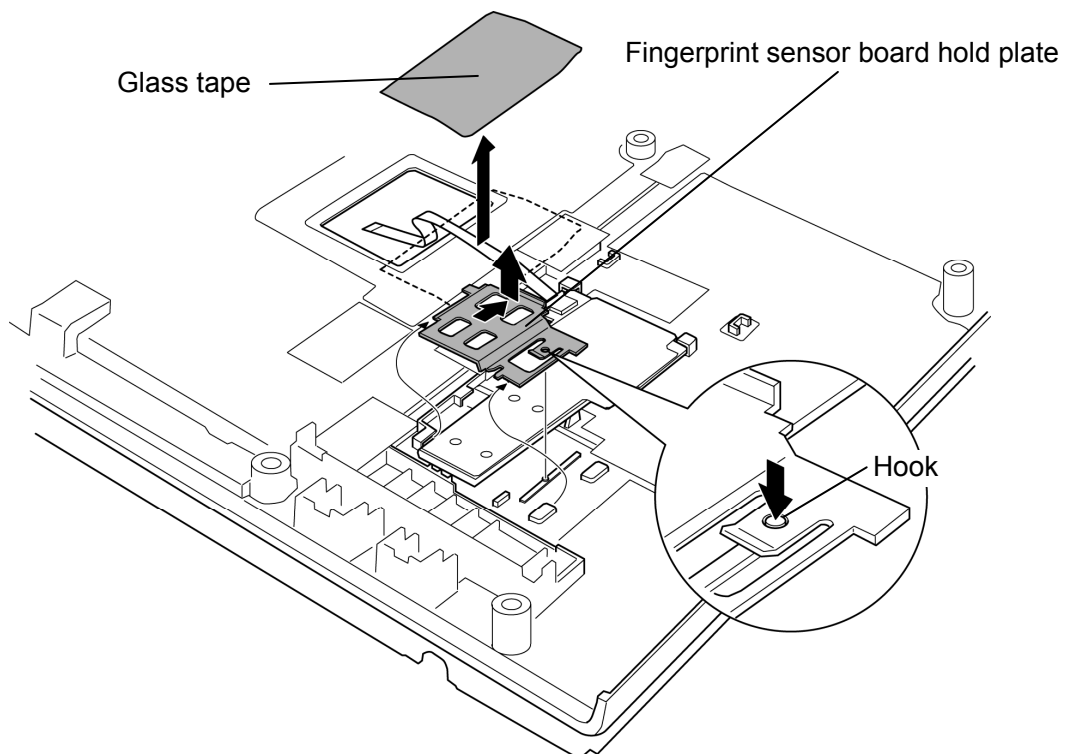


Figure 4-26 Removing the fingerprint sensor board hold plate

3. Remove the **fingerprint sensor board** fixed with the **double-sided tape** and peel off the double-sided tape that prevents a waterdrop from entering the computer.
4. Disconnect the **fingerprint sensor cable** from the connector on the fingerprint sensor board.

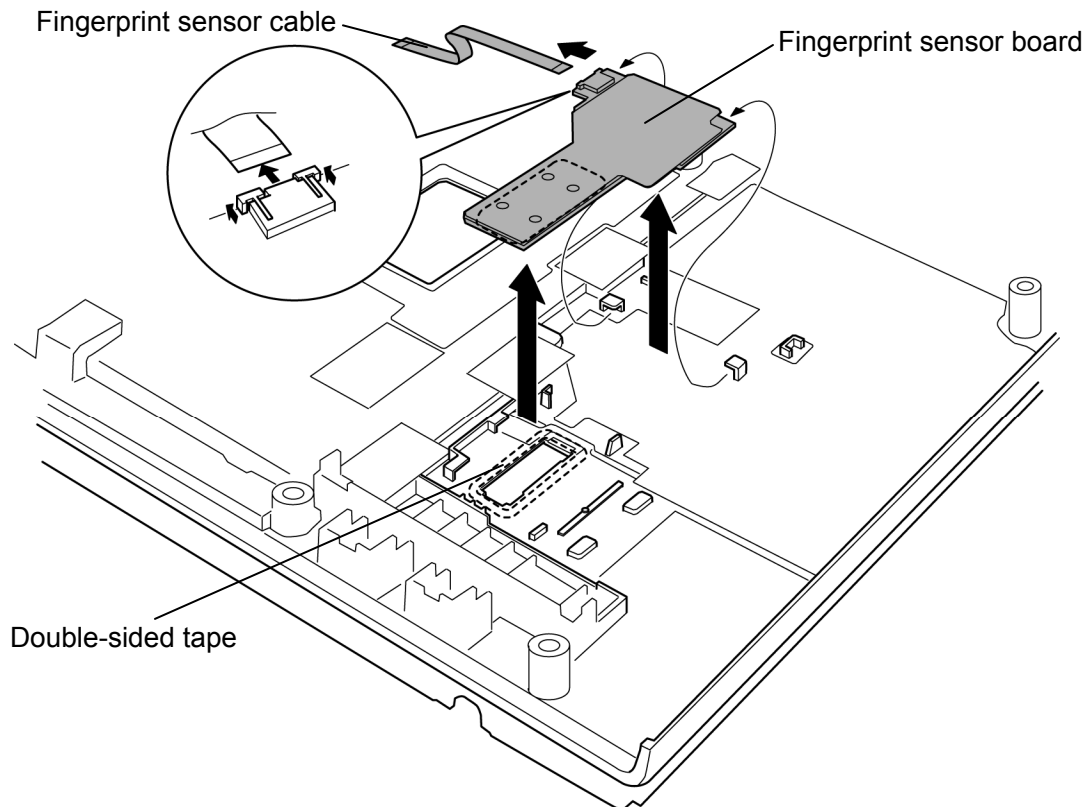


Figure 4-27 Removing the fingerprint sensor board

Installing the Fingerprint sensor board

The following describes the procedure for installing the fingerprint sensor board. (See Figure 4-26 and 4-27.)

1. Connect the **fingerprint sensor cable** to the connector on the fingerprint sensor board.
2. Stick a new **double-sided tape** in place and install the **fingerprint sensor board**.

NOTE: Do not reuse the removed double-sided tape.

3. Install the **fingerprint sensor board hold plate** while sliding it to the guides.
4. Arrange the fingerprint sensor cable and stick the **glass tape** in place.

4.16 RTC battery

Removing the RTC battery

The following describes the procedure for removing the RTC battery. (See Figure 4-28.)

1. Disconnect the **RTC battery cable** from the connector **CN9300** on the system board.
2. Peel off the **glass tape** and remove the **RTC battery** from the slot.

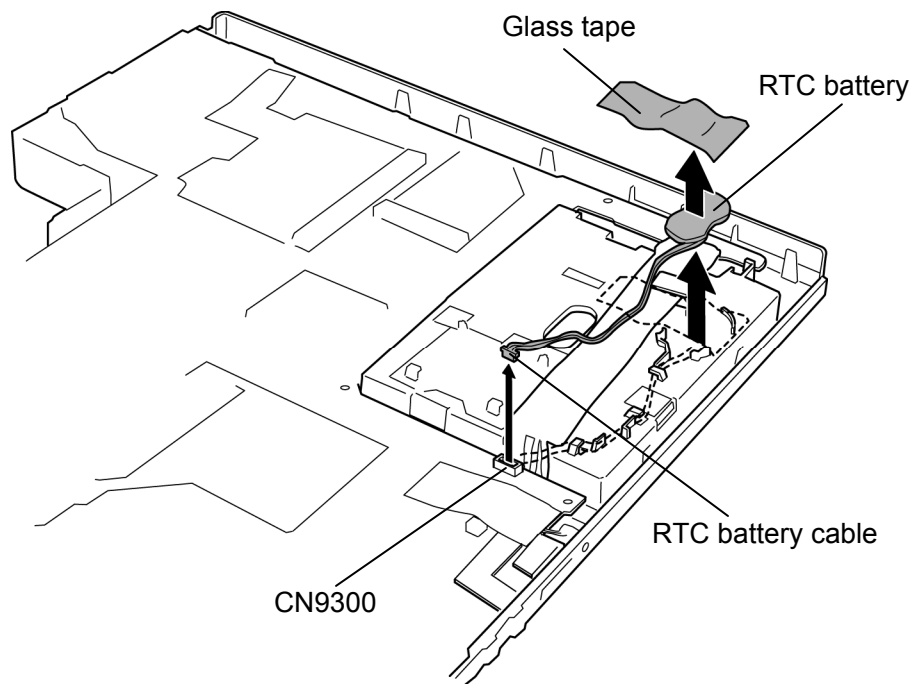


Figure 4-28 Removing the RTC battery

Installing the RTC battery

The following describes the procedure for installing the RTC battery. (See Figure 4-28.)

1. Install the **RTC battery** to the slot and stick the **glass tape** in place.
2. Arrange the **RTC battery cable** along the guides and connect it to the connector **CN9300** on the system board.

4.17 Microphone

Removing the Microphone

The following describes the procedure for removing the microphone. (See Figure 4-29.)

1. Peel off the **glass tape** and disconnect the **microphone cable** from the connector **CN6050** on the system board.
2. Remove the **microphone** from the slot.

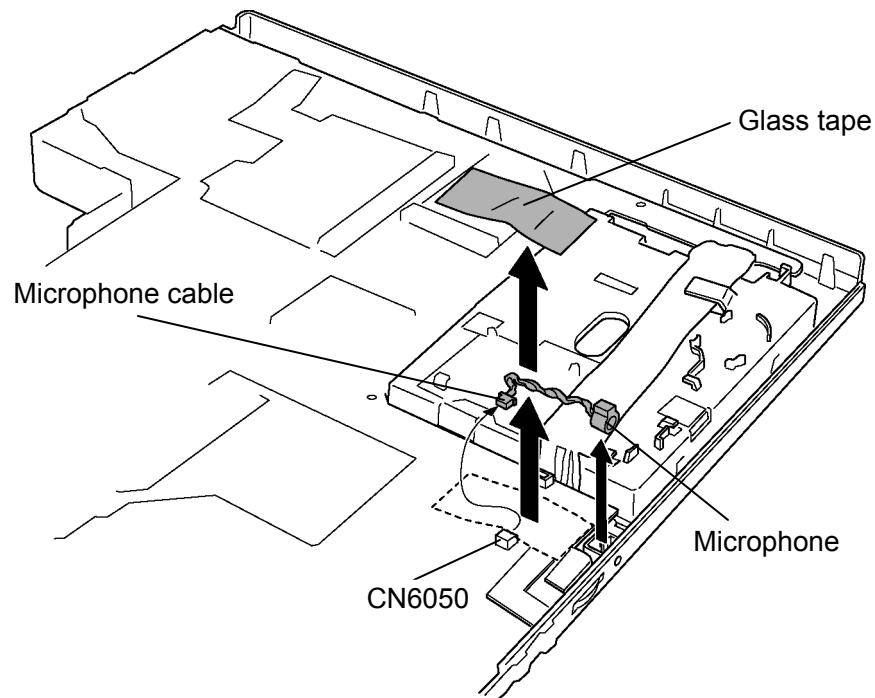


Figure 4-29 Removing the microphone

Installing the Microphone

The following describes the procedure for installing the microphone. (See Figure 4-29.)

1. Install the **microphone** to the slot.
2. Connect the **microphone cable** to the connector **CN6050** on the system board.
3. Stick the **glass tape** in place.

4.18 System board

Removing the System board

The following describes the procedure for removing the system board. (See Figure 4-30.)

1. Disconnect the **Bluetooth cable** from the connector **CN4400** on the system board.
2. Peel off the **insulator** and take out the **modem jack**, **DC-IN jack** and **HDD cable** from the slot.
3. Remove the **modem cable holder** from the slot. (The modem cable holder is adhered by the double-sided tape to the slot.)
4. Lift up the **system board** from the base assembly to remove while pushing the **portion A** and **portion B** of the base assembly outwards as shown in the figure below.

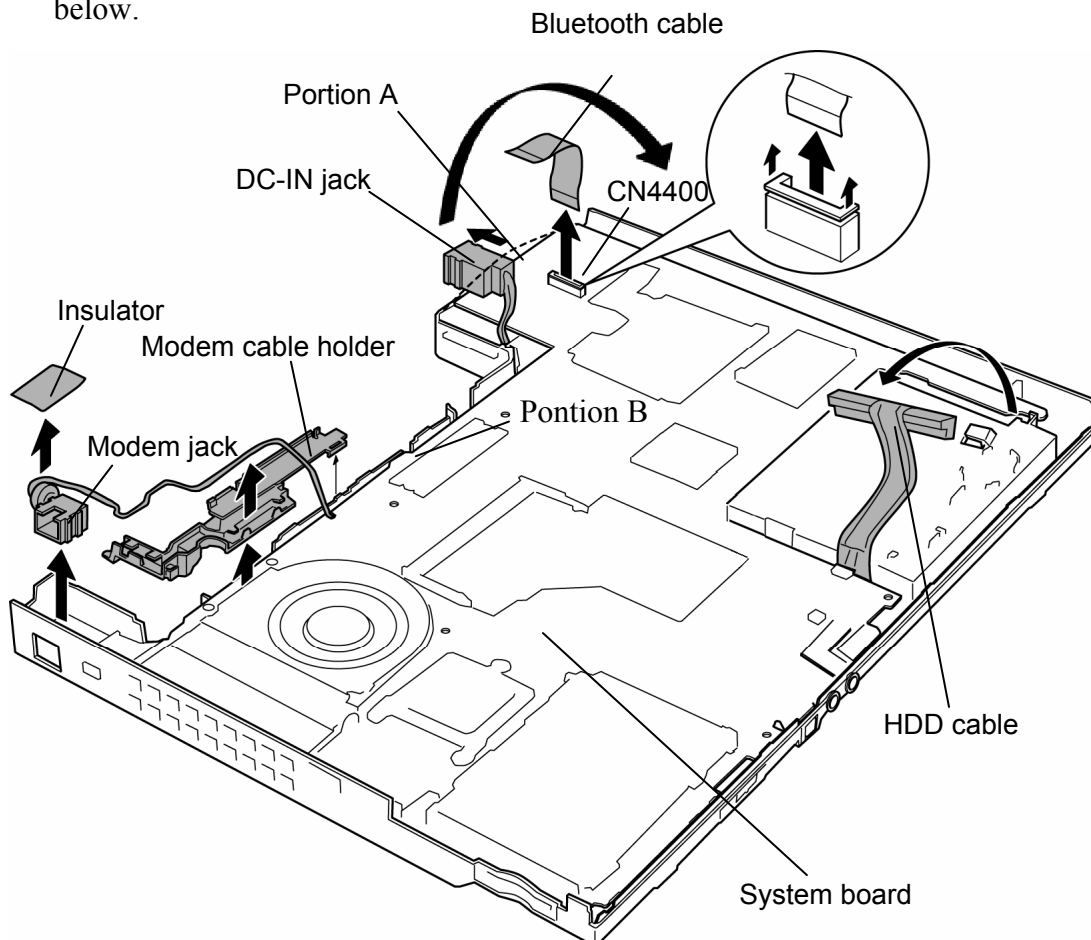
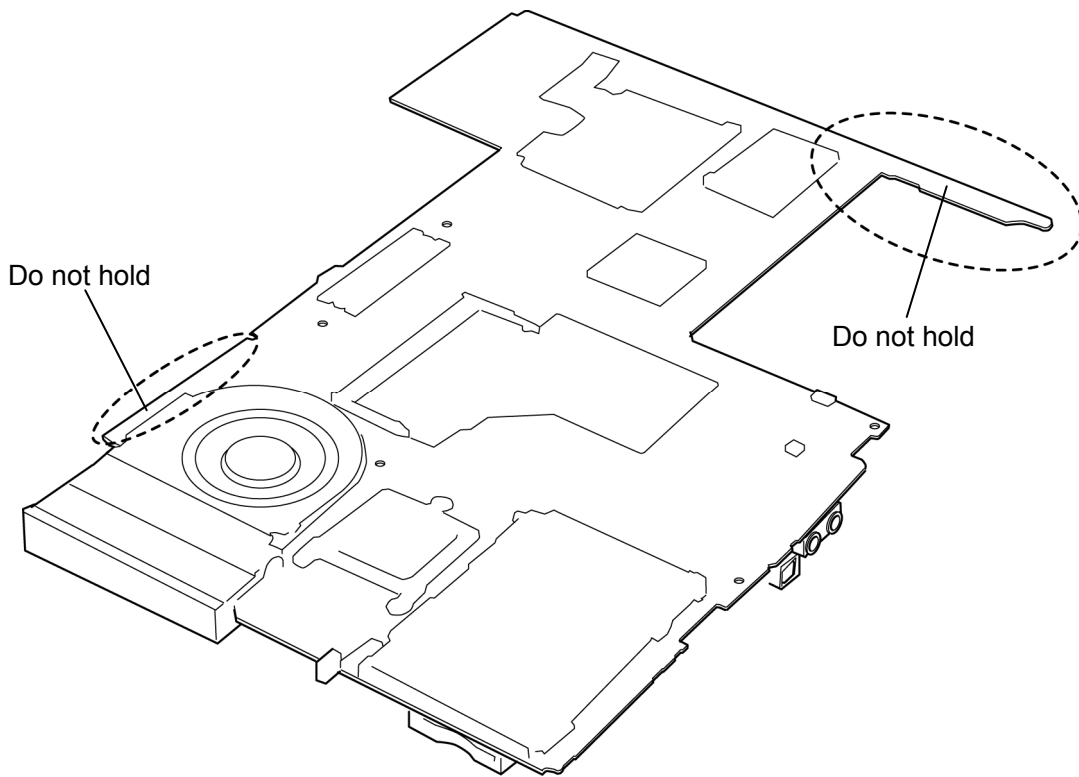


Figure 4-30 Removing the system board

CAUTION: Do not hold the portions (shown in the figure below) of the system board. It may damage the system board.



Installing the system board

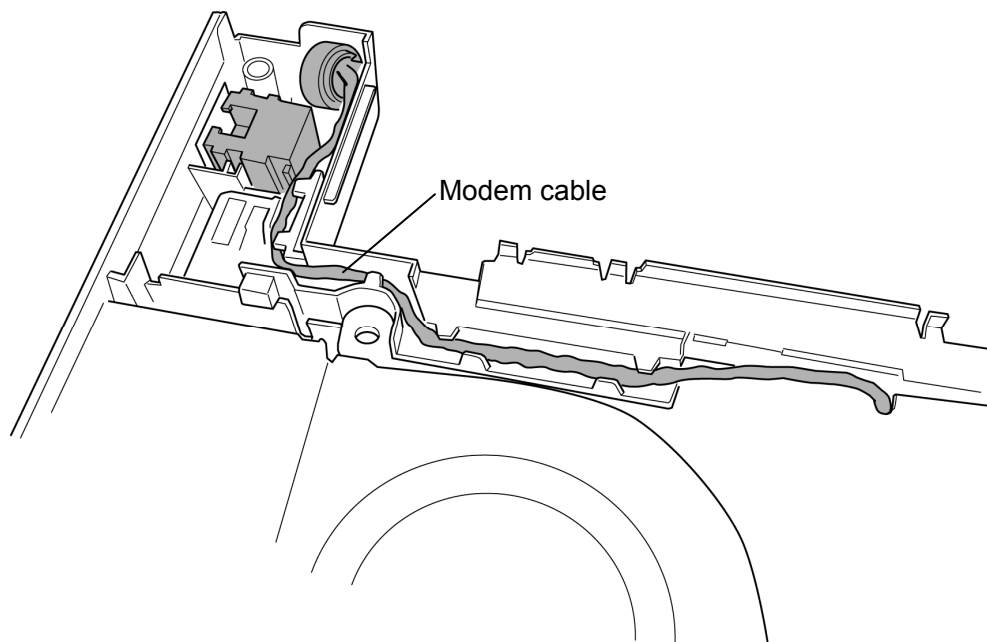
The following describes the procedure for installing the system board and LCD cover assembly. (See Figure 4-30.)

1. Install the **system board** on the base assembly.
2. Install the **modem cable holder** to the slot.

NOTE: When installing a new modem cable holder, reuse the **double-sided tape** and stick it in place. If the adhesive strength of the double-sided tape on the modem cable holder is weak, replace it with a new one.

3. Install the **modem jack, DC-IN jack** and **HDD cable** to the slot.

NOTE: Arrange the modem cable on the modem cable holder as shown in the figure below.



4. Stick the **insulator** in place.
5. Connect the Bluetooth cable to the connector **CN4400** on the system board.

4.19 Base latch

Removing the base latch

The following describes the procedure for removing the base latch. (See Figure 4-31.)

1. Remove the **base caps** on the bottom while releasing latches.
2. Remove the **base latches**. Be careful not lose the **springs**.

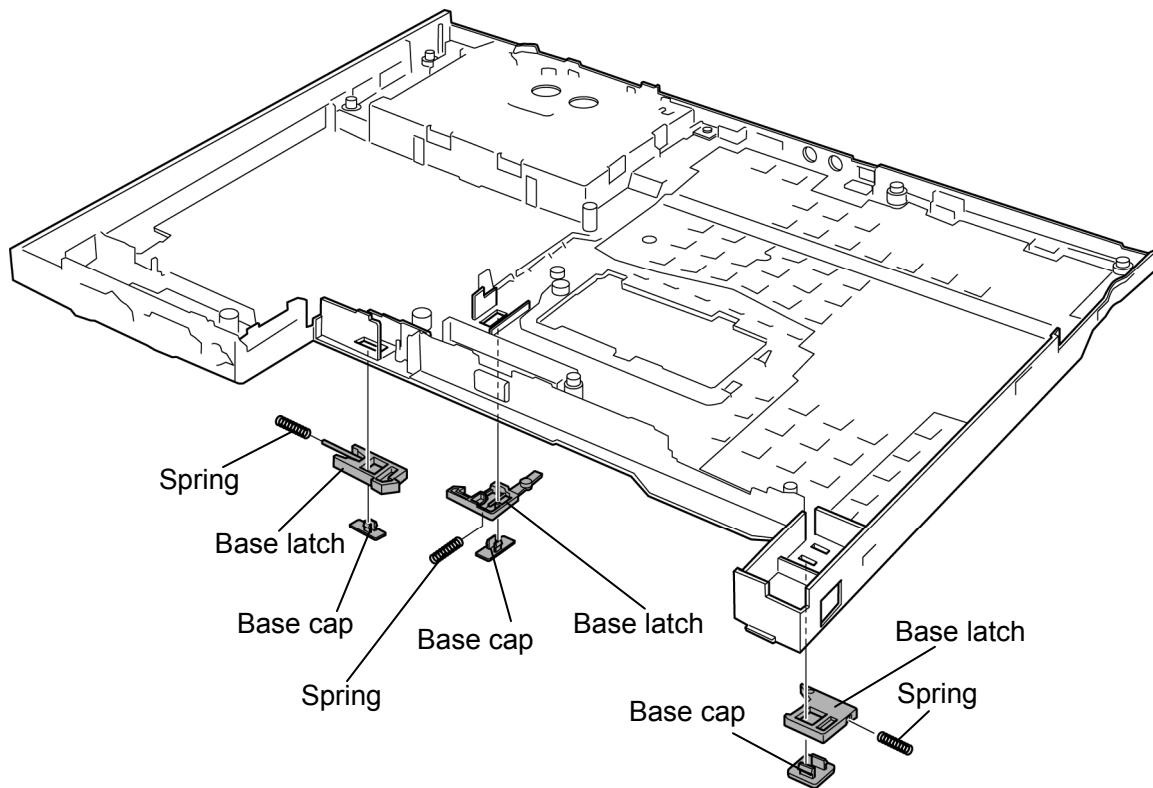


Figure 4-31 Removing the base latch

Installing the base latch

The following describes the procedure for installing the base latch (See Figure 4-31).

1. Install the **springs** to the base latches.
2. Install the **base latches** to the slot of the base assembly.
3. Install the **base caps** while engaging the **latches**.

4.20 HDD cable/DC-IN jack

Removing the HDD cable/DC-IN jack

The following describes the procedure for removing the HDD cable/DC-IN jack. (See Figure 4-32.)

1. Peel off the **insulator** and disconnect the **HDD cable** from the connector **CN1900** on the system board.
2. Disconnect the **DC-IN jack cable** from the connector **CN8800** on the system board.

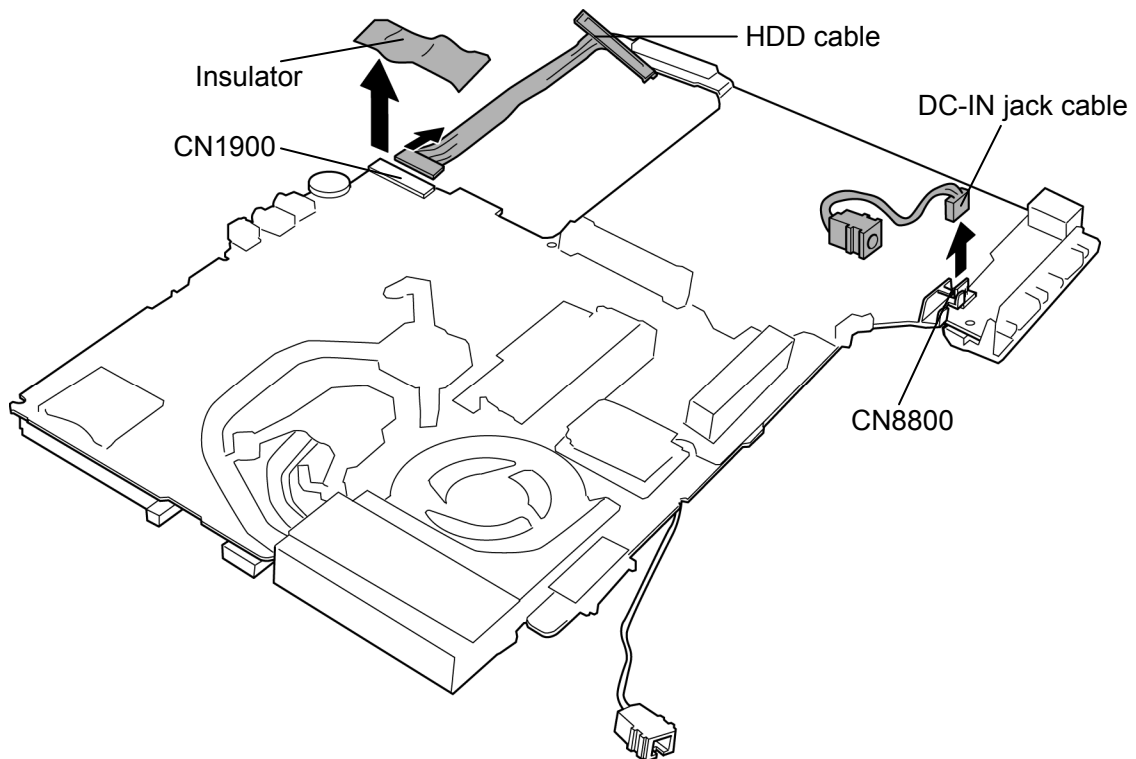


Figure 4-32 Removing the HDD cable/DC-IN jack

Installing the HDD cable/DC-IN jack

The following describes the procedure for installing the HDD cable/DC-IN jack. (See Figure 4-32.)

1. Connect the **DC-IN jack cable** to the connector **CN8800** on the system board.
2. Connect the following **HDD cable** to the connector **CN1900** on the system board and stick the **insulator** in place.

4.21 MDC

Removing the MDC

The following describes the procedure for removing the MDC. (See Figure 4-33.)

1. Remove the following **screws** securing the MDC.
 - M2×4B BIND screw ×2
2. Remove the **MDC** from the connector **CN3010** on the system board.
3. Disconnect the **MDC cable** from the connector on the MDC.

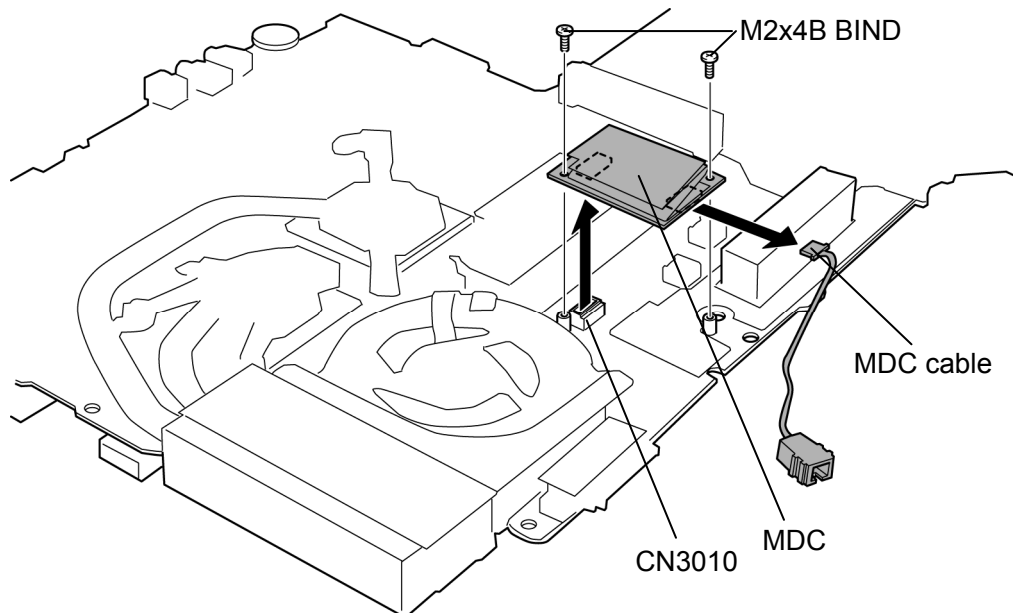


Figure 4-33 Removing the MDC

Installing the MDC

The following describes the procedure for installing the MDC. (See Figure 4-33.)

1. Connect the **MDC cable** to the connector on the MDC.
2. Install the **MDC** to the connector **CN3010** on the system board and secure it with the following **screws**.
 - M2×4B BIND screw ×2

4.22 North bridge heat sink/CPU heat sink/Fan/CPU

Removing the North bridge heat sink/CPU heat sink/Fan/CPU

The following describes the procedure for removing the North bridge heat sink/CPU heat sink/fan/CPU. (See Figure 4-34 to 4-37.)

1. Remove the following **screws** in the reverse order of the numbers marked on the North bridge hold plate and **North bridge hold plate**.

- M2×4B BIND screw ×2

2. Remove the **North bridge heat sink** on the North bridge.

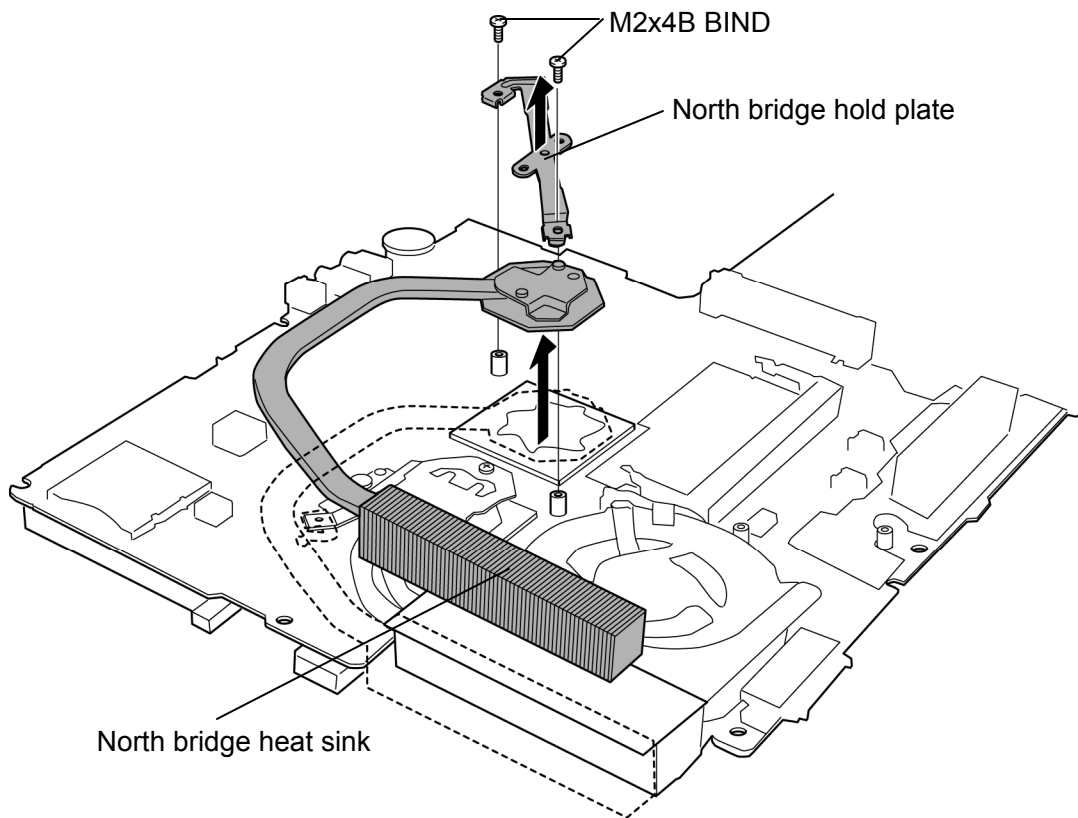


Figure 4-34 Removing the North bridge heat sink

3. Remove the following **screws** in the reverse order of the number marked on the CPU hold plate.
 - M2×4B BIND screw ×3
4. Remove the **CPU hold plate** and **metal plates**.
5. Disconnect the **fan cable** from the connector **CN8771** on the system board.
6. Remove the **CPU heat sink** (with a fan).

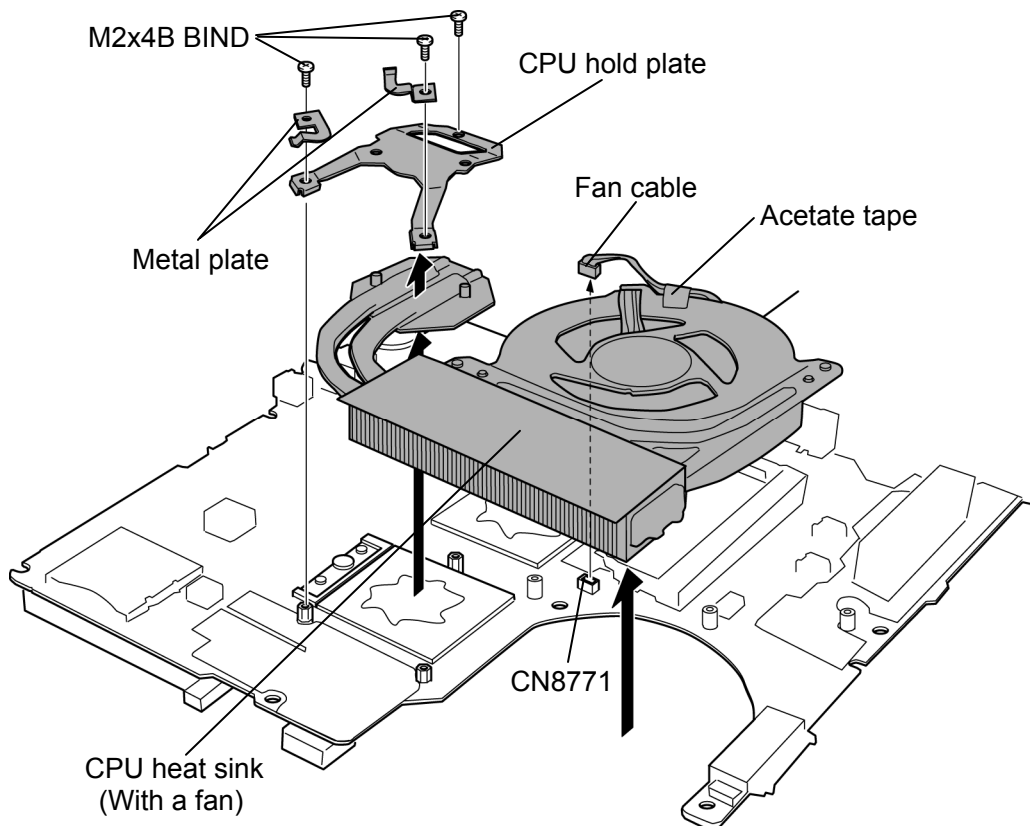


Figure 4-35 Removing the CPU heat sink (with a fan)

7. Remove the **fan holder**.
8. Remove the following **screws** and separate the **CPU heat sink** and **fan**. (Fan cable is secured to the fan by the insulator.)

- M2.5×3B FLAT HEAD screw ×2

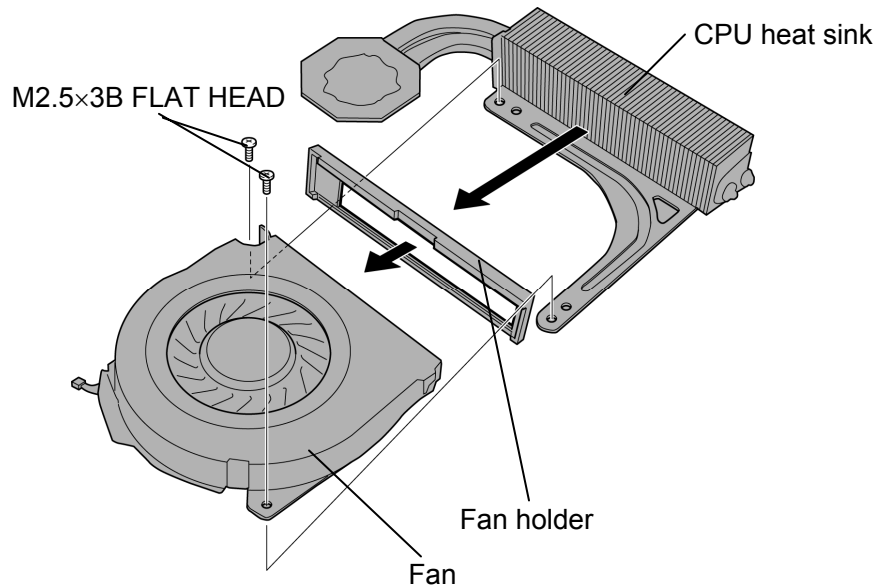


Figure 4-36 Removing the fan

9. Unlock the CPU by rotating counterclockwise the **cam** on the CPU socket by 90 degrees with a flat-blade driver.

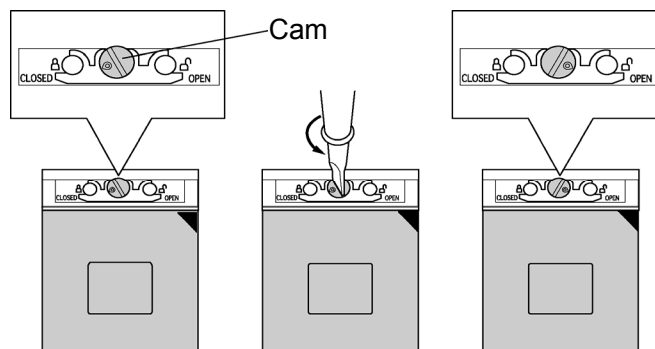


Figure 4-37 Removing the CPU

10. Remove the **CPU**.

CAUTION: When removing the CPU, lift it up right above. Otherwise, pins of CPU may be damaged.

Installing the North bridge heat sink/CPU heat sink/Fan/CPU

The following describes the procedure for installing the North bridge heat sink/CPU heat sink/fan/CPU. (See Figure 4-34 to 4-39.)

1. Make sure that the **cam** of the CPU socket is in the unlock (OPEN) position.
2. Install the **CPU** on the **CPU socket** and check the CPU is installed on the correct position.
3. Lock the CPU by rotating clockwise the cam on the CPU socket by 90 degrees with a flat-blade driver.

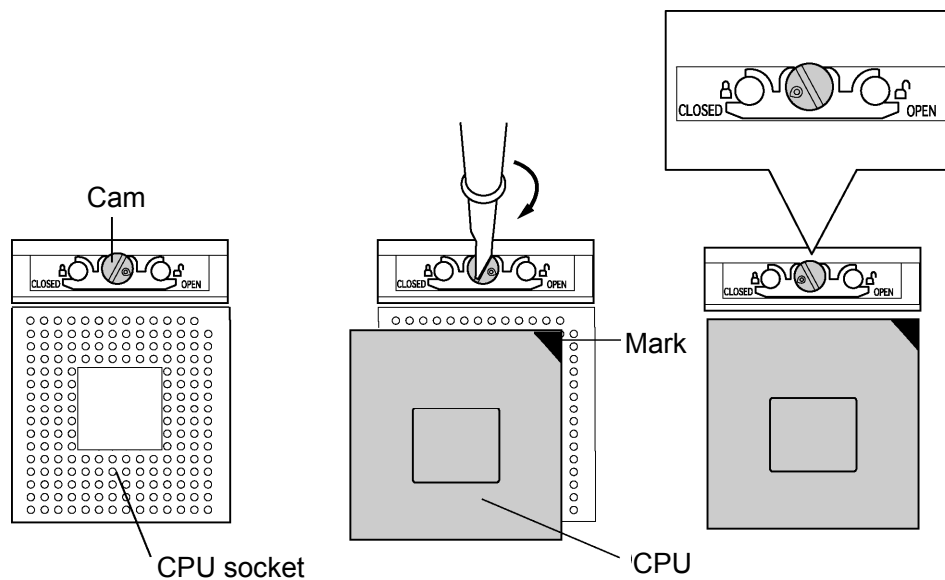


Figure 4-38 Installing the CPU

4. Apply new **grease** on the **CPU** and **North bridge** using a special syringe as shown in the following figure. Apply quarter of scale (0.25ml) of grease evenly on the CPU chip and North bridge chip. When silicon grease is already applied to the CPU, wipe them off with a cloth in advance.

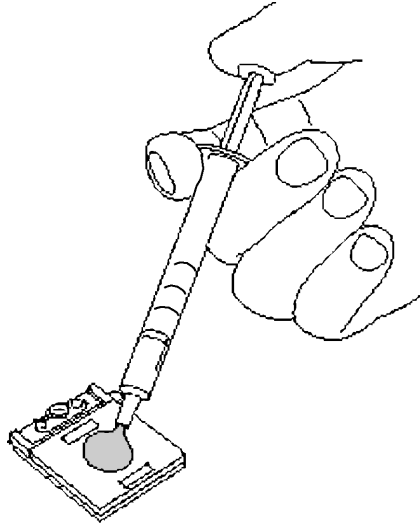


Figure 4-39 Applying new grease

5. Stick the **insulator** to the fan in place to secure the fan cable to the fan.
6. Install the **fan** to the **CPU heat sink** and secure them with the following **screws**.
 - M2.5×3B FLAT HEAD screw ×2
7. Install the **fan holder** in place.
8. Install the **CPU heat sink** (with the fan) in place.
9. Connect the **fan cable** to the connector **CN8771** on the system board and stick the **acetate tape** on it.
10. Install the **CPU hold plate** and **metal plate** on the CPU heat sink and secure them with the following **screws** in the order of the number marked on the **CPU hold plate**.
 - M2×4B BIND screw ×3
11. Install the **North bridge heat sink** in place.
12. Install the **North bridge hold plate** on the North bridge heat sink and secure them with the following **screws** in the order of the number marked on the North bridge hold plate.
 - M2×4B BIND screw ×2

4.23 LCD unit/FL inverter

Removing the LCD unit/FL inverter

The following describes the procedure for removing the LCD unit/FL inverter. (See Figure 4-40 to 4-44.)

1. Peel off the **mask seals** (6 points) and remove the following **screws** securing the LCD unit.
 - M2.5×6B FLAT HEAD screw ×2
2. Remove the keyboard cover while releasing latches. (In the case of removing the LCD unit before removing the keyboard.)
3. Release the latches fixing the display rear cover to the LCD mask in the order from the top to both sides and lay the **display rear cover** down as shown in the figure below.

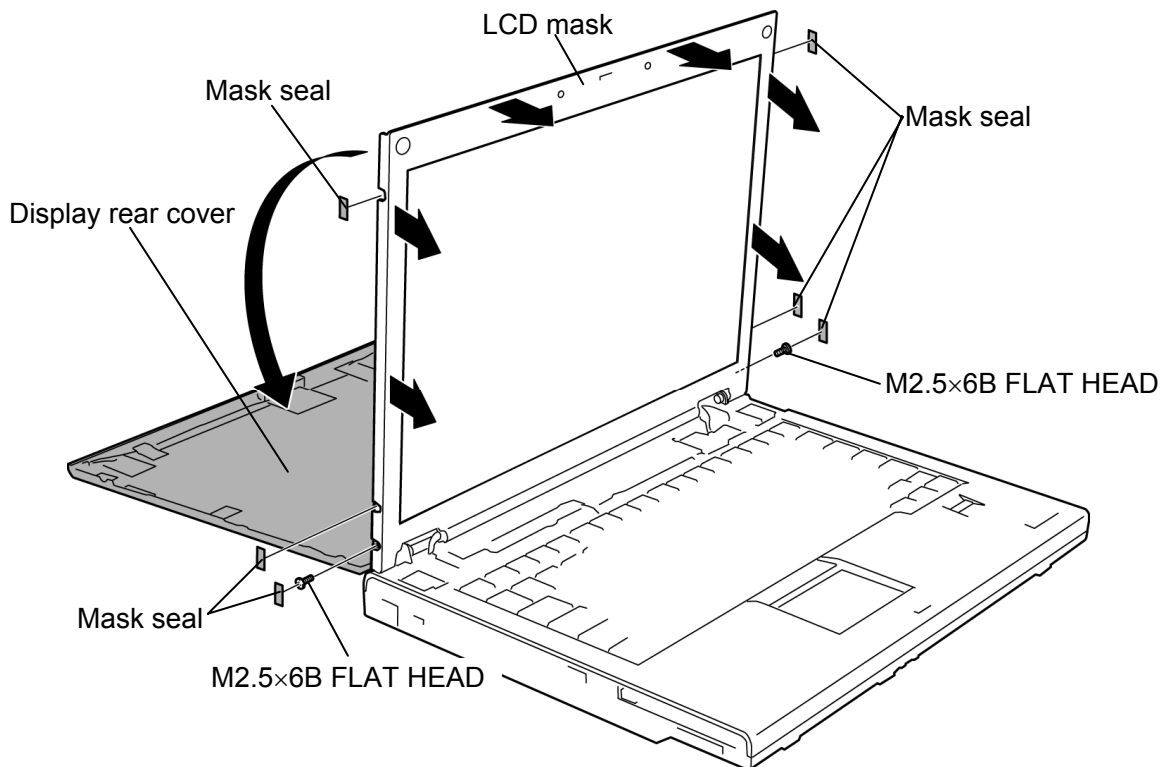


Figure 4-40 Raying the display rear cover

4. Put the **soft cloth** on the keyboard and lay the **LCD unit** down as shown in the figure below.

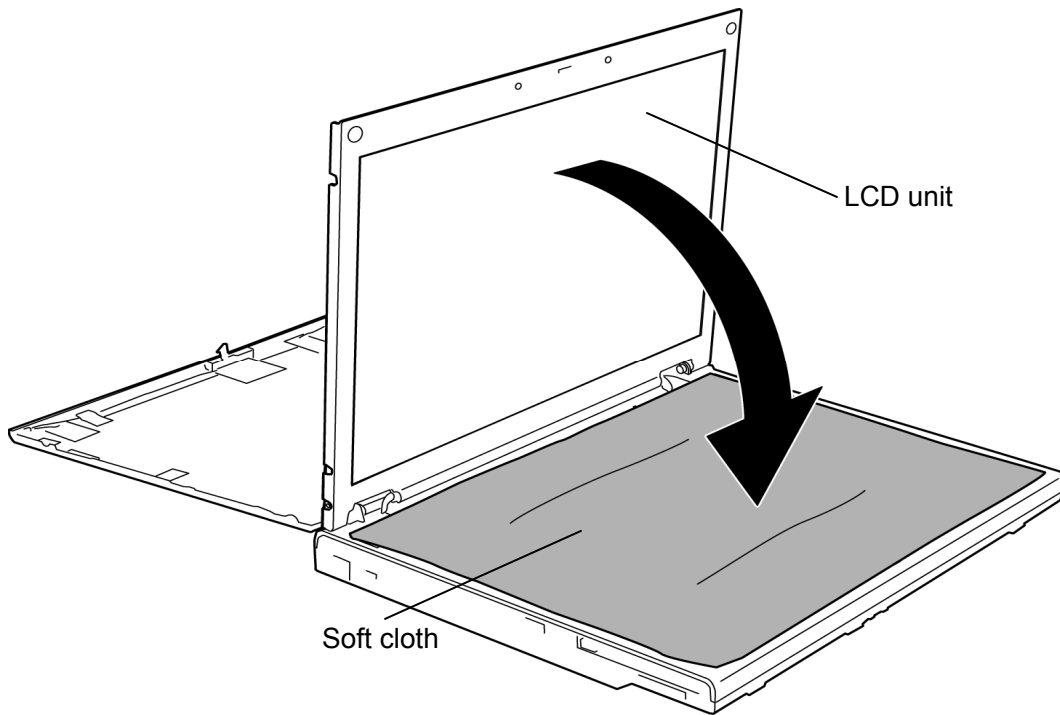


Figure 4-41 Raying the LCD unit

5. Peel off the **insulator** (with double-sided tape) on the FL inverter.
6. Disconnect the **FL cables** from both sides of the FL inverter.
7. Remove the **FL inverter** from the slot.

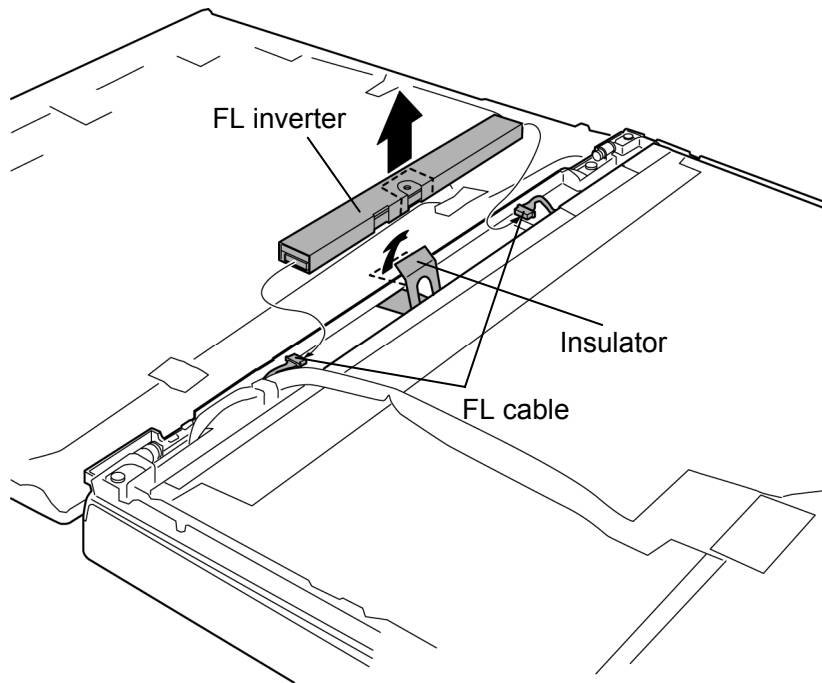


Figure 4-42 Removing the FL inverter

8. Remove two **glass tapes** securing the LCD cable and disconnect the **LCD cable** from the connector on the LCD unit.

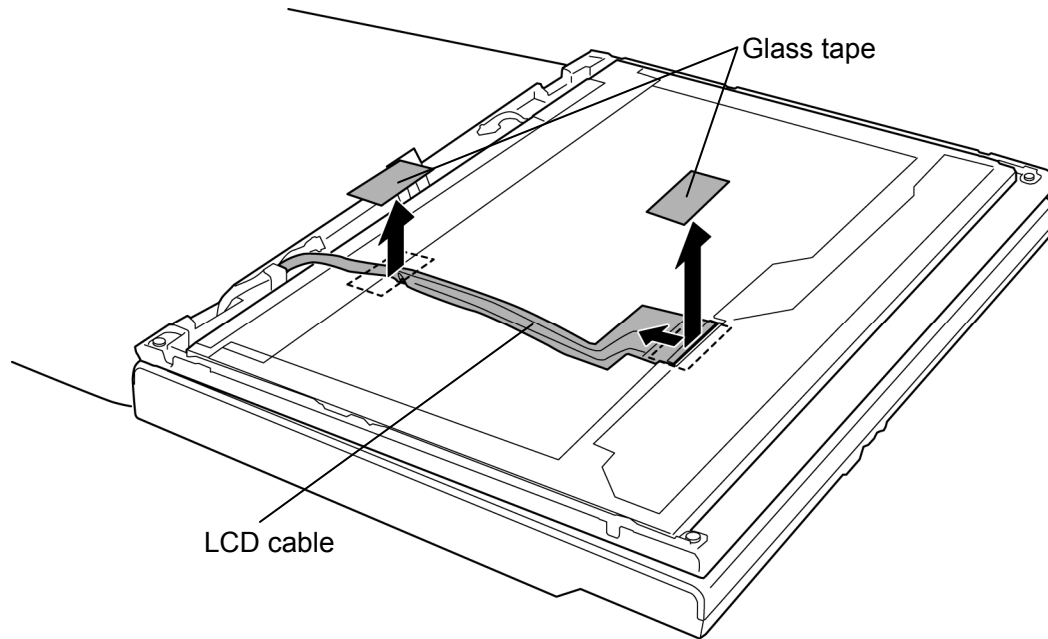


Figure 4-43 Removing the LCD cable

9. Remove the following screws and **LCD unit**.

- M2×3C S-THIN HEAD screw ×4

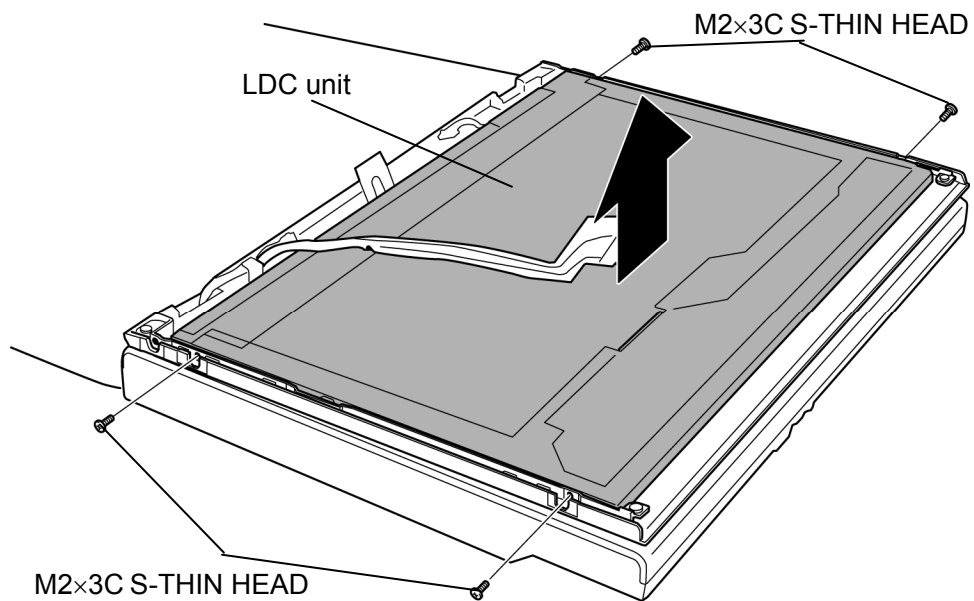


Figure 4-44 Removing the LCD unit

Installing the LCD unit/FL inverter

The following describes the procedure for installing the LCD unit/FL inverter. (See Figure 4-40 to 4-44.)

1. Install the **LCD unit** to the display cover and secure it with the following **screws**.
 - M2×3C S-THIN HEAD screw ×4
2. Connect the **LCD cable** to the connector on the back of the LCD unit. Stick two **glass tapes** in place.
3. Connect two **FL cables** to a new FL inverter and install the **FL inverter** in place.

CAUTION: Do not reuse the removed FL inverter.

4. Fix the FL inverter with the **insulator**.
5. Stand the LCD unit up and fix the **display rear cover** to the **LCD mask** while engaging the latches.
6. Secure the LCD unit with the following **screws** and stick the **mask seals** in place.
 - M2.5×6B FLAT HEAD screw ×2
7. Install the **keyboard cover** while engaging latches. (In the case of removing the LCD unit before removing the keyboard.)

4.24 LCD cable

Removing the LCD cable

The following describes the procedure for removing the LCD cable. (See Figure 4-44 and 4-45.)

1. Close the hinges and turn over the cover assembly and peel off the **acetate tape** fixing the LCD cable. When closing the hinges, be careful not to push the upper portion of them.
2. Turn over the cover assembly and open the display
3. Pass the **LCD cable** and the **connector** through the holes of the cover assembly and LCD mask from the front to the back and remove the LCD cable on the back of the LCD mask.

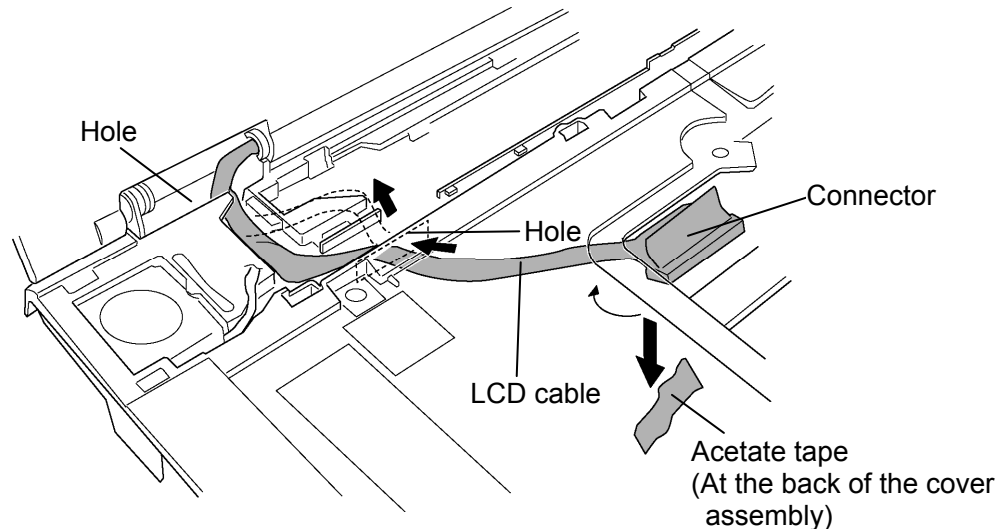


Figure 4-45 Removing the LCD cable

Installing the LCD cable

The following describes the procedure for installing the LCD cable. (See Figure 4-44 and 4-45.)

1. Pass the **LCD cable** and the **connector** through the holes of the LCD mask and cover assembly from the back to the front.
2. Close the hinges and turn over the cover assembly and arrange the LCD cable on the cover assembly.
3. Stick the **acetate tape** on the LCD cable.

4.25 Wireless LAN antenna/Bluetooth antenna

Removing the Wireless LAN antenna/Bluetooth antenna

The following describes the procedure for removing the wireless LAN antenna/Bluetooth antenna (See Figure 4-46.)

1. Peel off the **acetate tapes** securing the wireless LAN antenna cables and Bluetooth antenna cable.
2. Remove the **wireless LAN antennas** and **Bluetooth antenna** from the slot of the display rear cover.

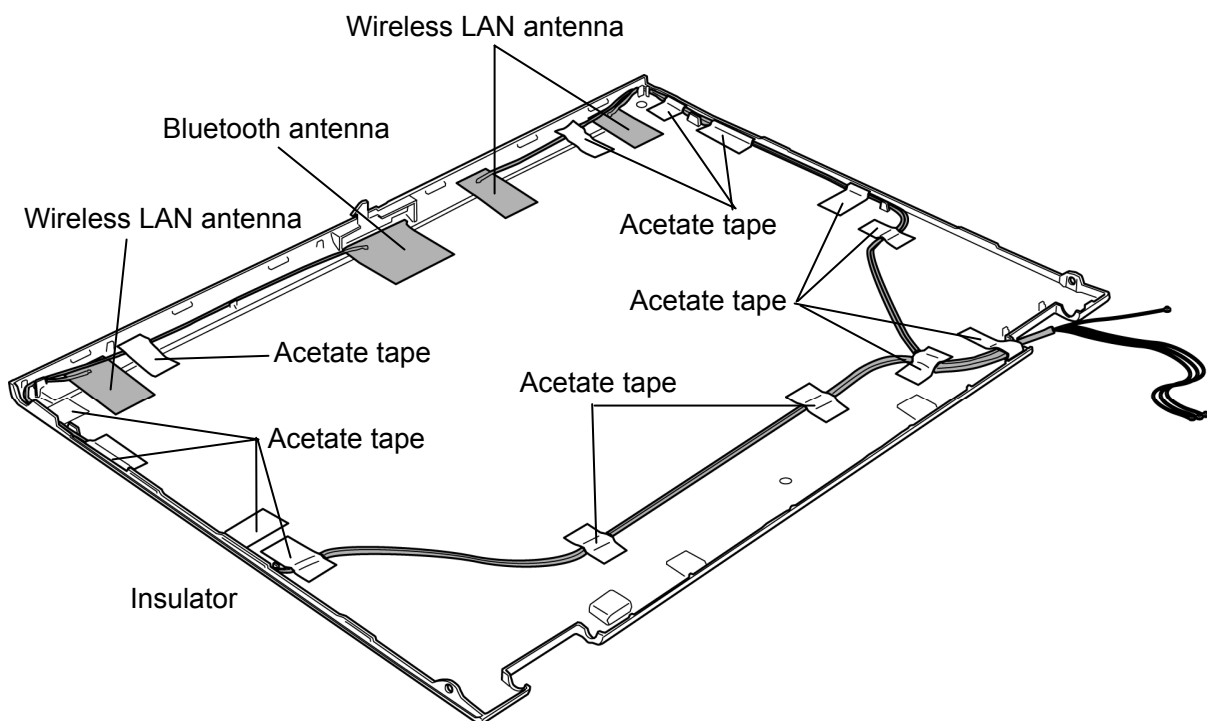


Figure 4-46 Removing the wireless LAN antenna/Bluetooth antenna

Installing the Wireless LAN antenna/Bluetooth antenna

The following describes the procedure for installing the wireless LAN antenna/Bluetooth antenna. (See Figure 4-46.)

1. Install the **wireless LAN antennas** and **Bluetooth antenna** to the display cover.
2. Arrange the **wireless LAN antenna cables** and **Bluetooth antenna cable** on the display rear cover and secure it with the **acetate tapes**.

4.26 Hinge

Removing the Hinge

The following describes the procedure for removing the hinge. (Figure 4-47 and 4-48.)

1. Push the LCD mask down.

CAUTION: Do not push the top of the LCD mask. It may break the LCD mask.

2. Remove the following screws.

- M2.5×4B FLAT HEAD screw ×4

3. Stand the hinges up with the LCD mask and remove the **LCD mask**.

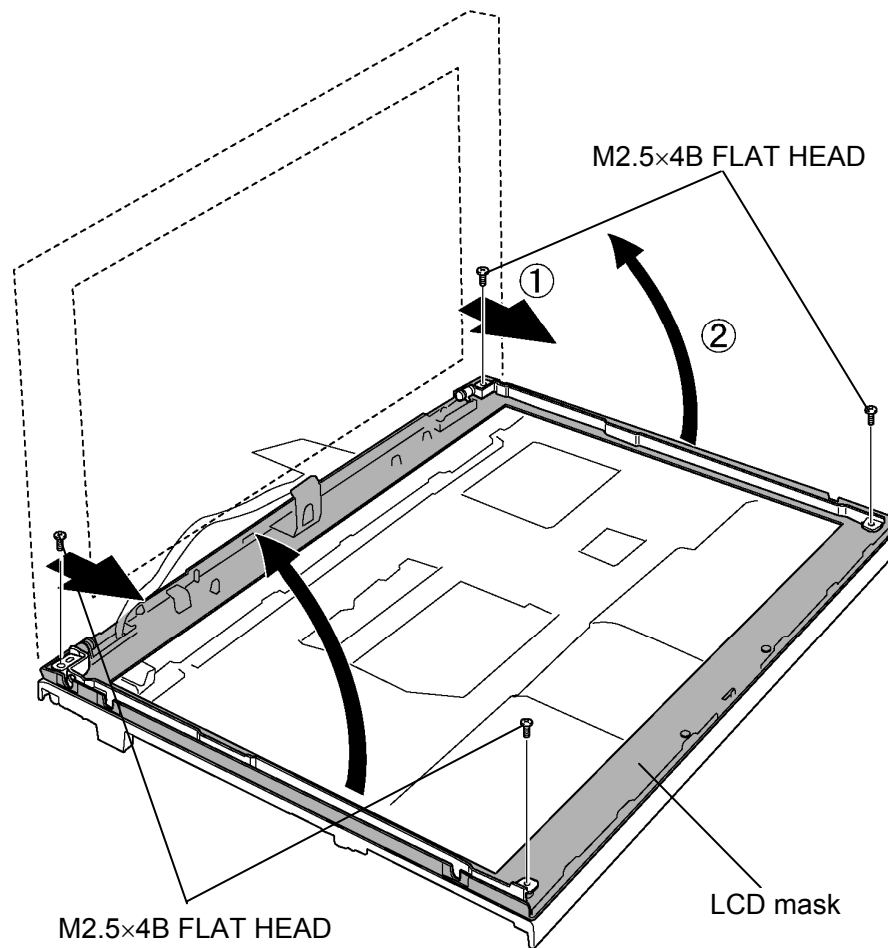


Figure 4-47 Removing the hinge (1)

4. Turn over the cover assembly and remove the following **screws** and **metal plate**.
 - M2.5×6C Tapping screw ×1
 - M2×4B S-THIN HEAD screw ×1
5. Slide the left hinge inside and remove it through the hole.
6. Remove the following **screw** and **right hinge**.
 - M2.5×6C Tapping screw ×1
7. Slide the right hinge inside and remove it through the hole.

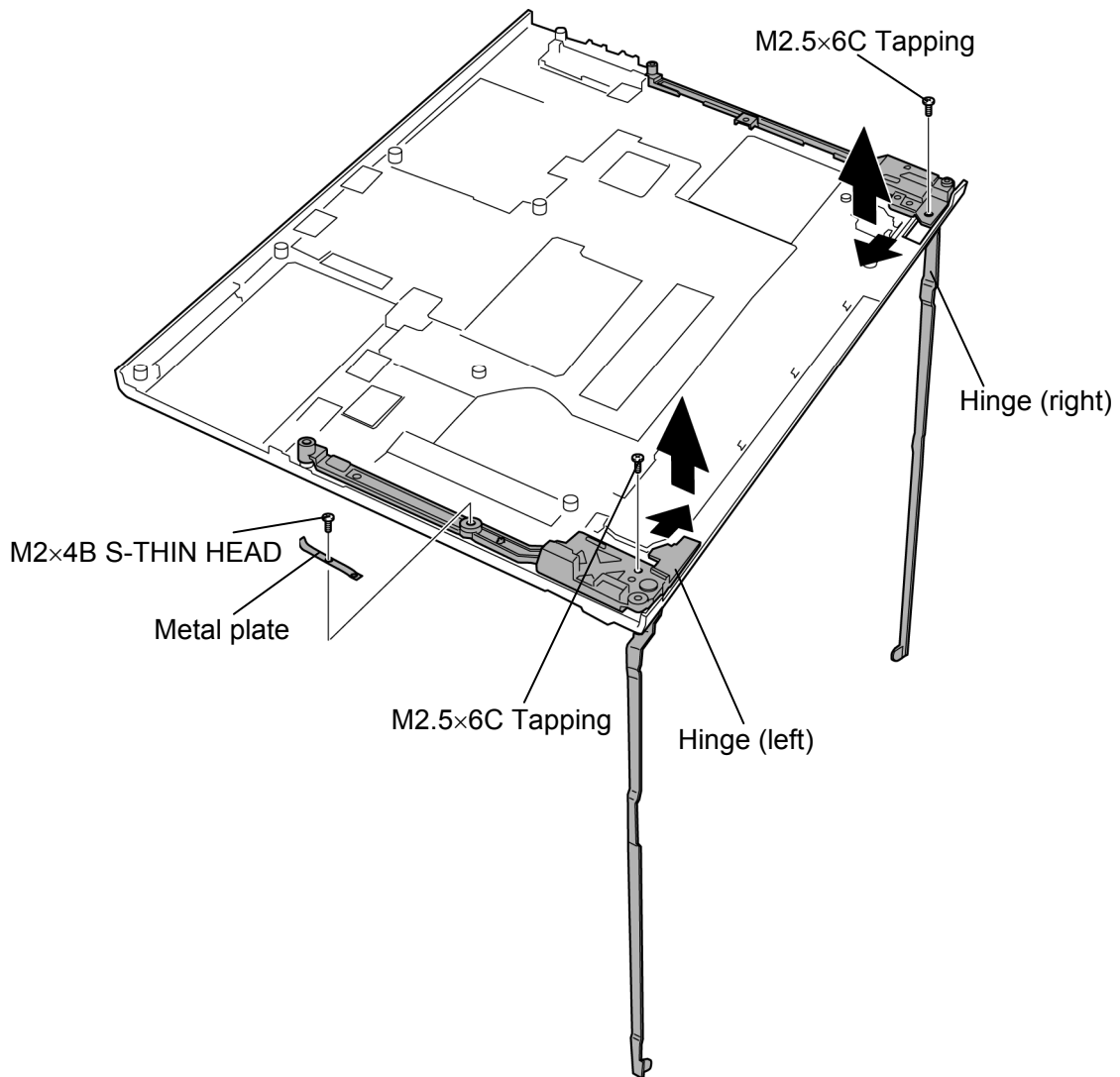


Figure 4-48 Removing the hinge (2)

Installing the Hinge

The following describes the procedure for installing the hinge. (Figure 4-47 and 4-48.)

1. Pass the **right hinge** through the hole and secure it with the following **screw**.
 - M2.5×6C Tapping screw ×1
2. Pass the **left hinge** through the hole.
3. Secure the **left hinge** and **metal plate** with the following **screws**.
 - M2.5×6C Tapping screw ×1
 - M2×4B S-THIN HEAD screw ×1
4. Set the **LCD mask** to the hinges and secure it with the following **screws**.
 - M2.5×4B FLAT HEAD screw ×4

4.27 Speaker

Removing the Speaker

The following describes the procedure for removing the speaker. (Figure 4-49.)

1. Peel the **plastic tape** and pass the connector of the **speaker cable** through the hole of the cover assembly.
2. Remove the **speakers** (left and right) from the slot.

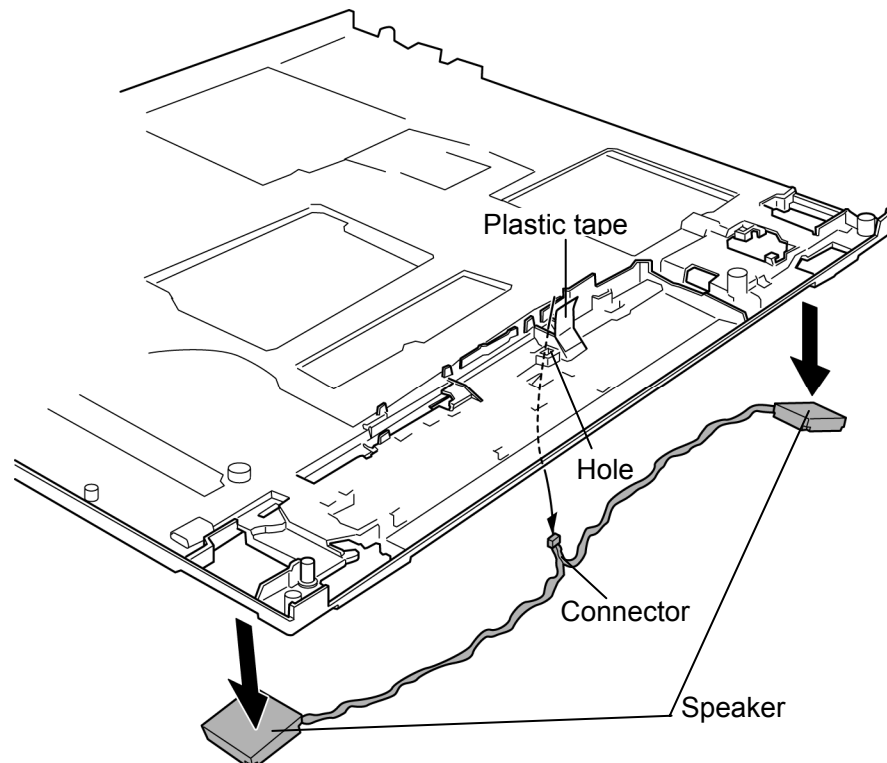


Figure 4-49 Removing the speaker

Installing the Speaker

The following describes the procedure for installing the speaker. (Figure 4-49 to 4-51.)

1. Install the **speakers** (left and right) to the slots (left and right) after installing the hinges.
2. Pass the connector of the **speaker cable** through the hole.

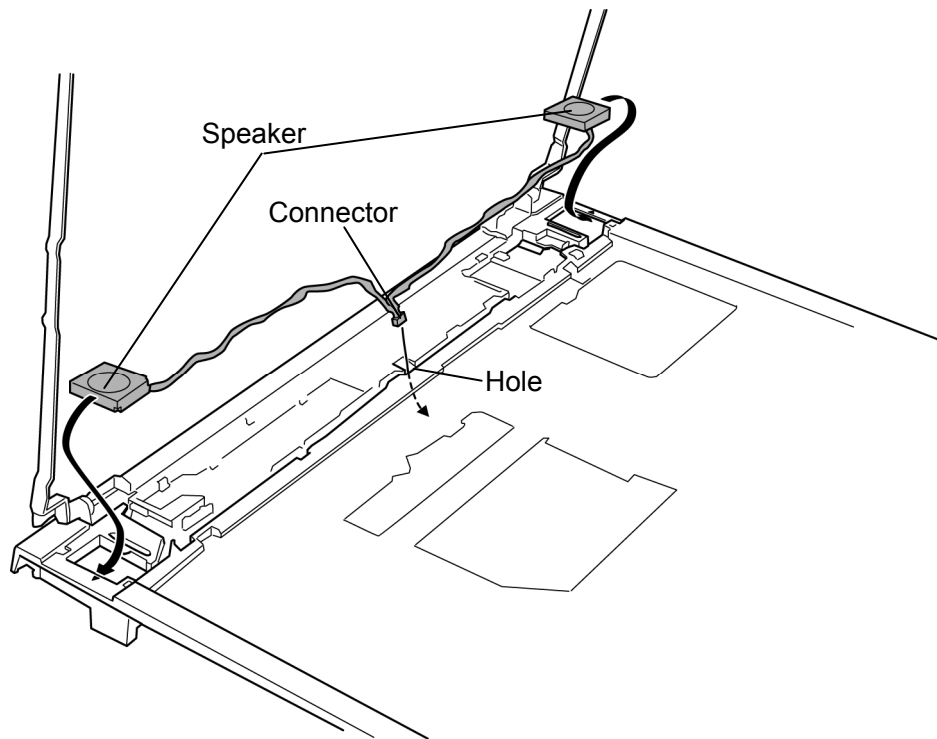


Figure 4-50 Installing the speaker

3. Arrange the **speaker cable** on the slot of the cover assembly.

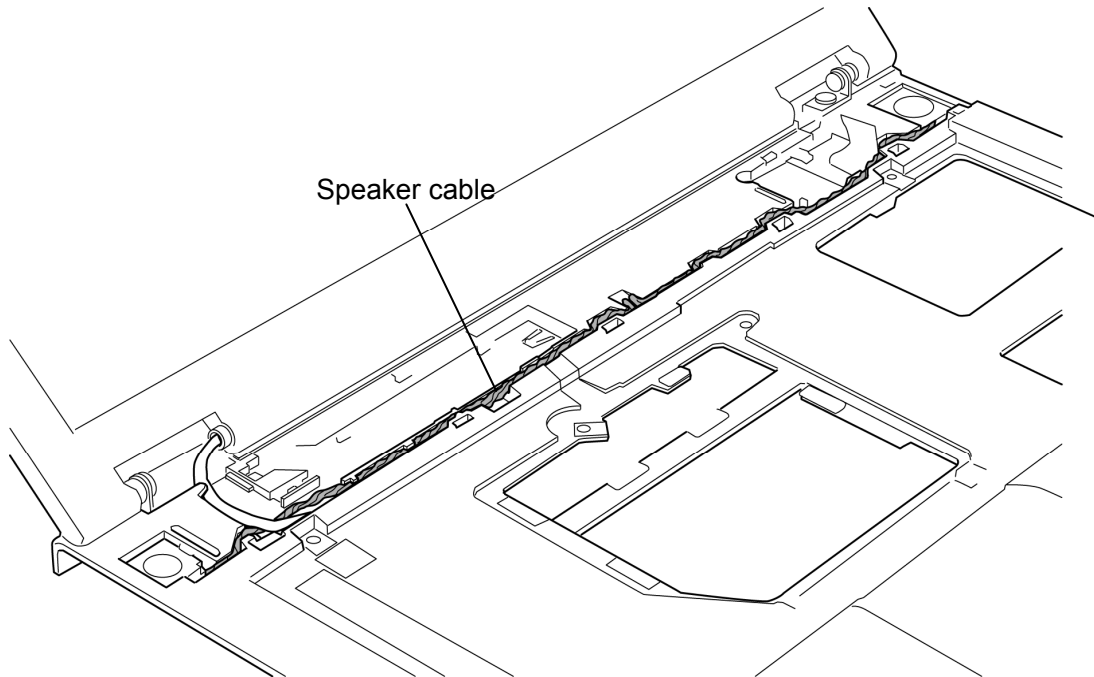


Figure 4-51 Arranging the speaker cable

4. Turn over the cover assembly and stick the **plastic tape**.

4.28 Fluorescent Lamp

This system uses LCD modules from the following suppliers. The procedure for replacing the fluorescent lamp is different for each LCD module. Refer to the appropriate procedure.

| Type | Part No. | Supplier | Section |
|-------------------|--------------|------------|---------|
| 14.1-inch (WXGA) | G33C00041110 | LG Philips | 4.28.1 |
| | G33C0003X110 | SAMSUNG | 4.28.2 |
| 14.1-inch (WXGA+) | G33C00043110 | LG Philips | 4.28.3 |

- NOTE:**
- *When working with a LCD module, always use a flat, grounded table.*
 - *Handle the backlight unit in the environment without dust, such as on the clean bench. Keep the worktable free from any screws or other material that may scratch the LCD surface.*
 - *Use an anti-static or protective sheet.*
 - *When replacing the FL unit, cover with a finger protector or similar to prevent soiling or scratching the LCD panel.*
 - *Be careful when handling the lamp. Excessive force may break the lamp.*
 - *Be careful not to soil or deform the lamp reflector.*
 - *Make sure that the power of the LCD module is turned off before connecting or disconnecting cables and connectors.*

4.28.1 Replacing the 14.1-inch WXGA LG Philips Fluorescent Lamp

CAUTION: When replacing the fluorescent lamp, wear finger covers or gloves to avoid contaminating or damaging the LCD panel. Be careful not to let dust or other foreign substance into the module.

To replace the 14.1-inch WXGA LG Philips fluorescent lamp, follow the steps below and refer to Figure 4-52 to 4-59.

Disassembly of outside tape / Cover shield

1. Disassembly of Tape Adhesive used for Top case fixing

CAUTION: Pressure or stress should not be given on Top case during this process.

2. Disassembly of Cover shield (G).

CAUTION: Pressure or stress should not be given on Gate COF.

3. Disassembly of Cover shield (S).

CAUTION: Pressure or stress should not be given on Source PCB.
Usage of gloves with anti-electric discharge coating is recommended.
To eliminate possible damage on circuits occurred by ESC.

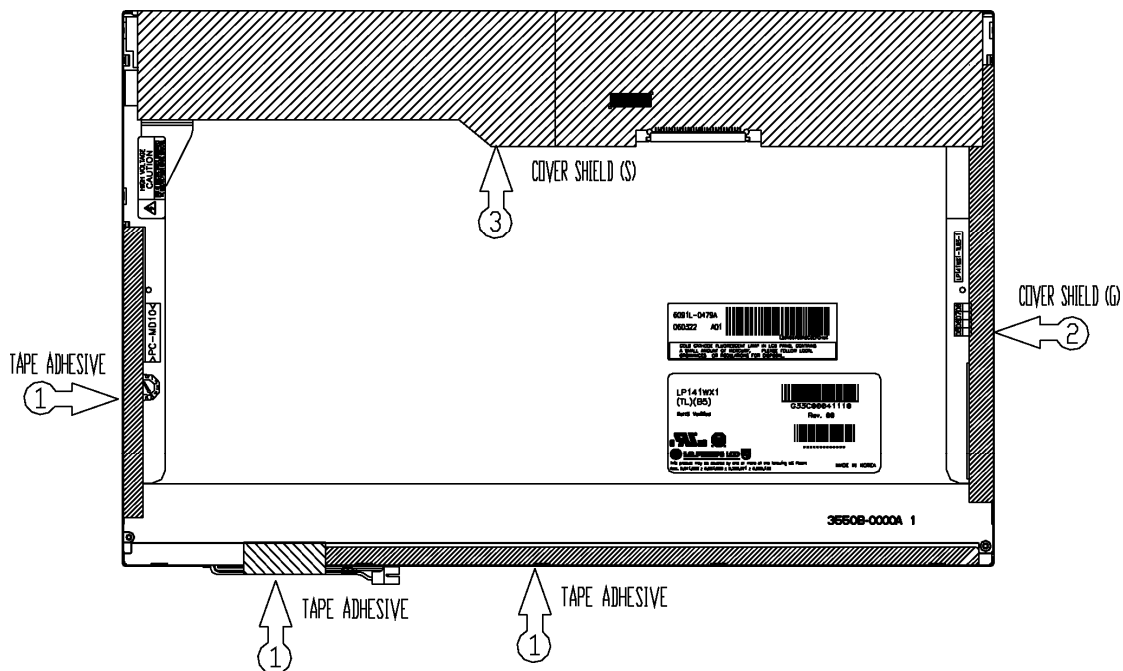


Figure 4-52 Replacing LG.Philips fluorescent lamp (WXGA) (1)

Disassembly of Top Case

1. Disassembly of Top Case.

CAUTION: Pressure or stress should not be given on PCB and COF.

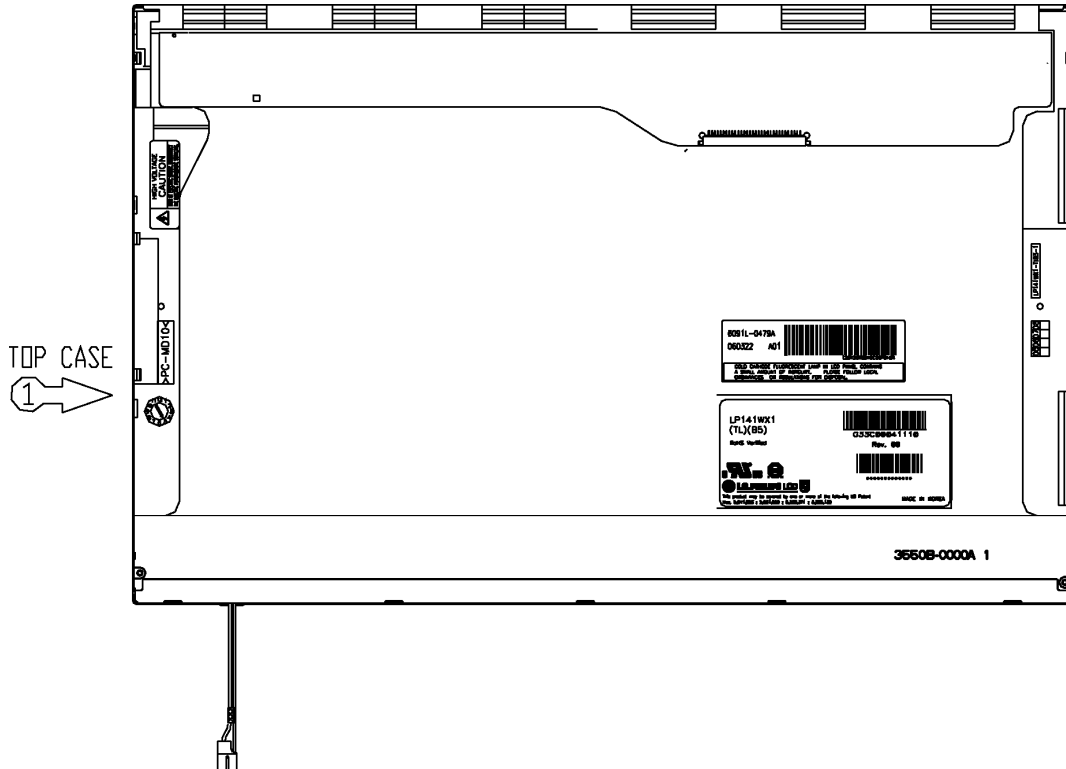


Figure 4-53 Replacing LG.Philips fluorescent lamp (WXGA) (2)

Disassembly of Source PCB

1. Disassembly of Source PCB.

CAUTION: Pressure or stress should not be given on PCB and COF.

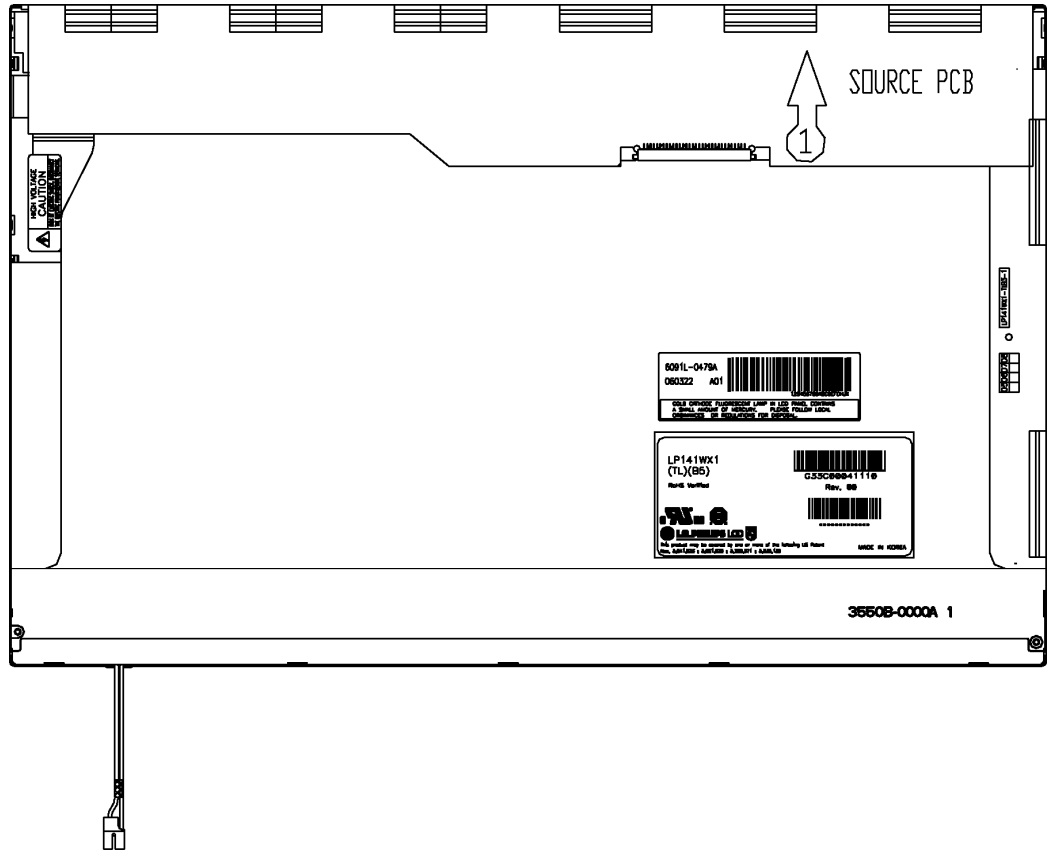


Figure 4-54 Replacing LG.Philips fluorescent lamp (WXGA) (3)

Disassembly of Board Ass'y, Tape Adhesive, Sheets, Light guide, Cover Ass'y Bottom (L)

1. Disassembly of Board Ass'y.

CAUTION: This process should be made in Clean room with no scratch nor particle on Polarizer and B/L Ass'y.

2. Disassembly of Tape Adhesive used for Sheets fixing (4 Points).
3. Disassembly of Sheets and Light guide.

CAUTION: No penetration of foreign body is indispensable with no scratch on the surface of each Sheet.

4. Disassembly of Screw (2 Points) and Cover Ass'y Bottom (L).

CAUTION: Maximum value of torque with Screw should be below 2.5kgf cm.

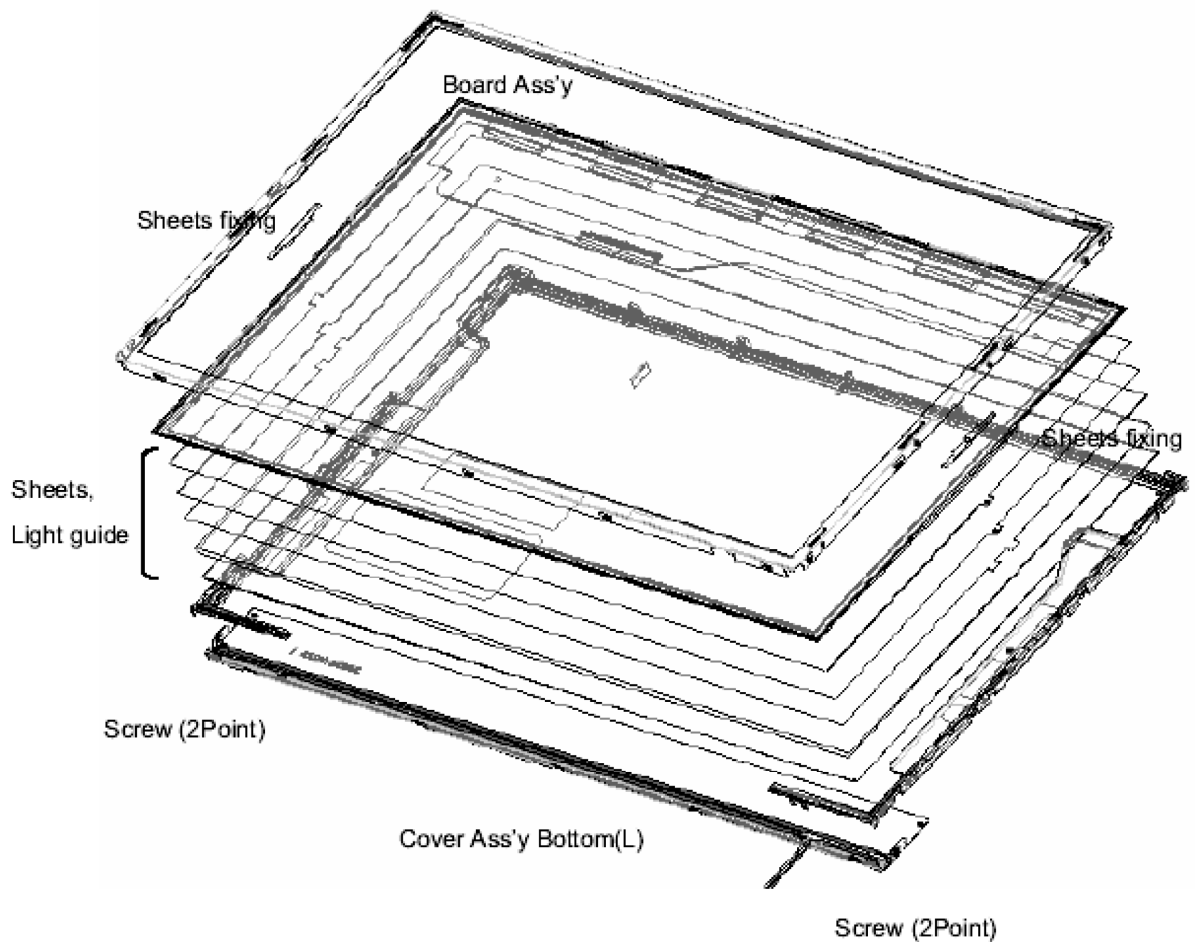


Figure 4-55 Replacing LG.Philips fluorescent lamp (WXGA) (4)

Assembly of Cover Ass'y Bottom (L), Sheets, Light guide, Tape Adhesive and Board Ass'y

1. Detach a release paper from Double Tape at the Cover Ass'y Bottom (L).
2. Assembly of Cover Ass'y Bottom (L) and Screw (2Point).

CAUTION: Maximum value of torque with Screw should be below 2.5kgf.cm.

3. Assembly of Light Guide and Sheets.

CAUTION: No penetration of foreign body is indispensable with no scratch on the surface of each Sheet and Light guide.

4. Assembly of Tape adhesive used for Sheets fixing (4 Points).
5. Assembly of Board Ass'y.

CAUTION: Pressure or stress should not be given on PCB and COF.

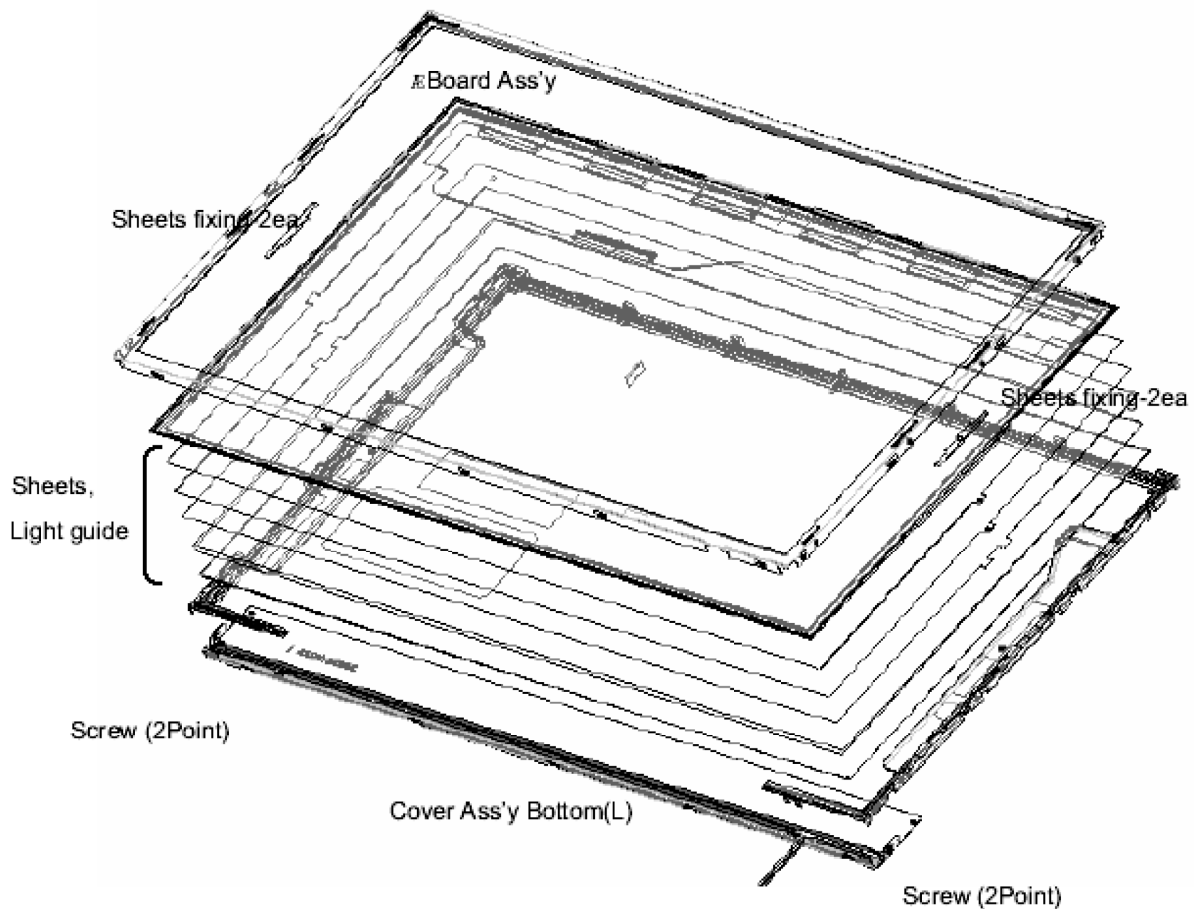


Figure 4-56 Replacing LG.Philips fluorescent lamp (WXGA) (5)

Assembly of Source PCB

1. Assembly of Source PCB.

CAUTION: Stress should not be given on COF.

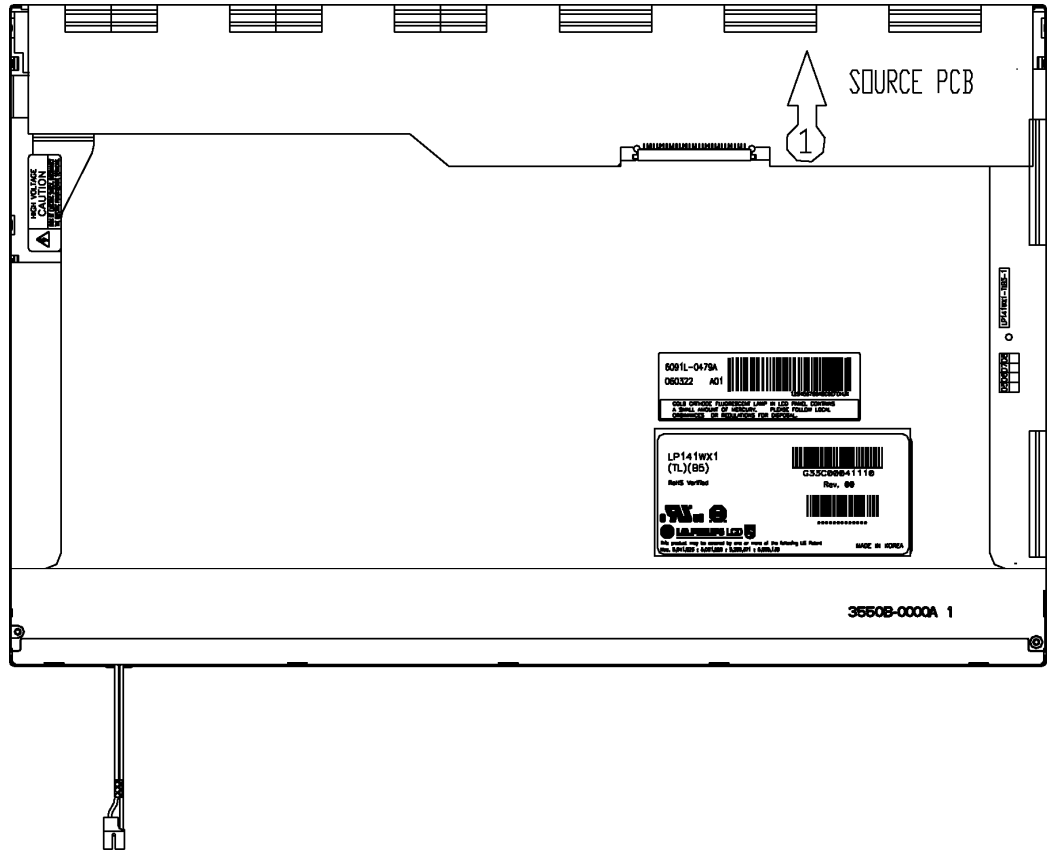


Figure 4-57 Replacing LG.Philips fluorescent lamp (WXGA) (6)

Assembly of Top Case

1. Assembly of Top Case.

CAUTION: Pressure should not be given on PCB and COF.

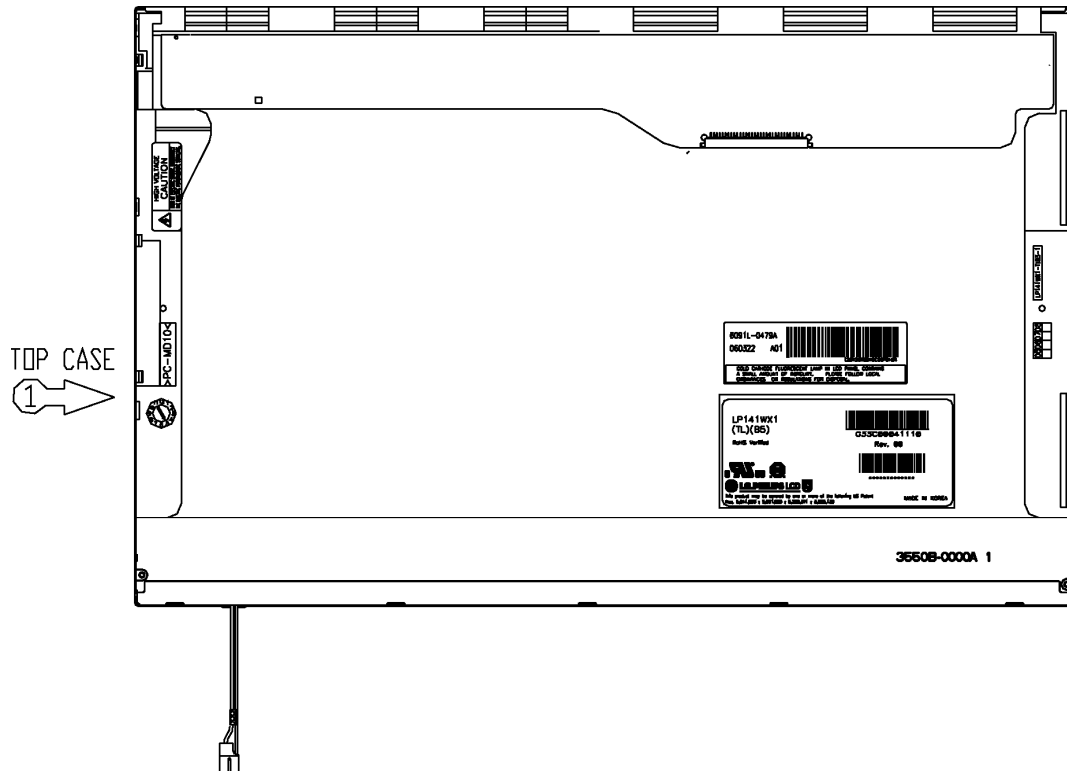


Figure 4-58 Replacing LG.Philips fluorescent lamp (WXGA) (7)

Assembly of outside Tape and Cover shield

1. Assembly of Cover shield (S).

CAUTION: Pressure or stress should not be given on Source PCB.
Usage of gloves with anti-electric discharge coating is recommended.
To eliminate possible damage on circuits occurred by ESC.

2. Assembly of Cover shield (G).

CAUTION: Pressure or stress should not be given on Gate COF.

3. Assembly of Tape Adhesive used for Top case fixing.

CAUTION: Pressure or stress should not be given on Top case during this process.

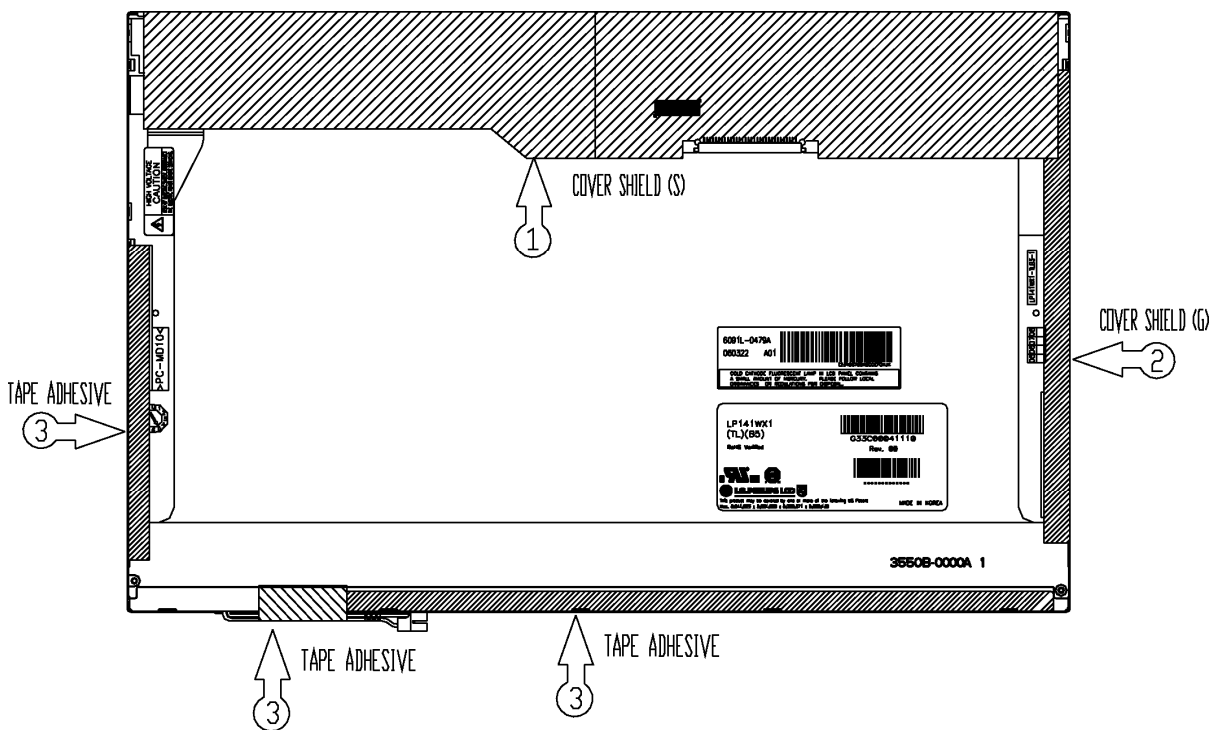


Figure 4-59 Replacing LG.Philips fluorescent lamp (WXGA) (8)

4.28.2 Replacing the 14.1-inch WXGA Samsung Fluorescent Lamp

To replace the 14.1-inch WXGA Samsung fluorescent lamp, follow the steps below and refer to figures 4-60 to 4-63.

Removing the fluorescent lamp

1. Remove the PCB cover.

CAUTION: Handle with care not to damage COF of S/D ICs.

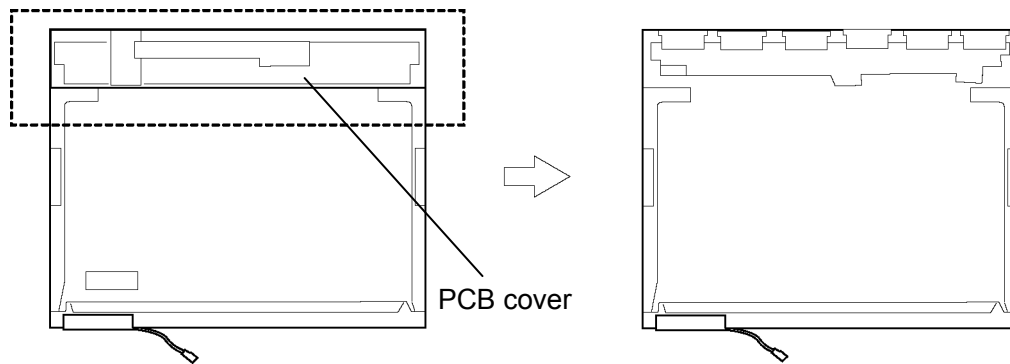


Figure 4-60 Replacing Samsung fluorescent lamp (WXGA) (1)

2. Remove the side tapes and AI tape.

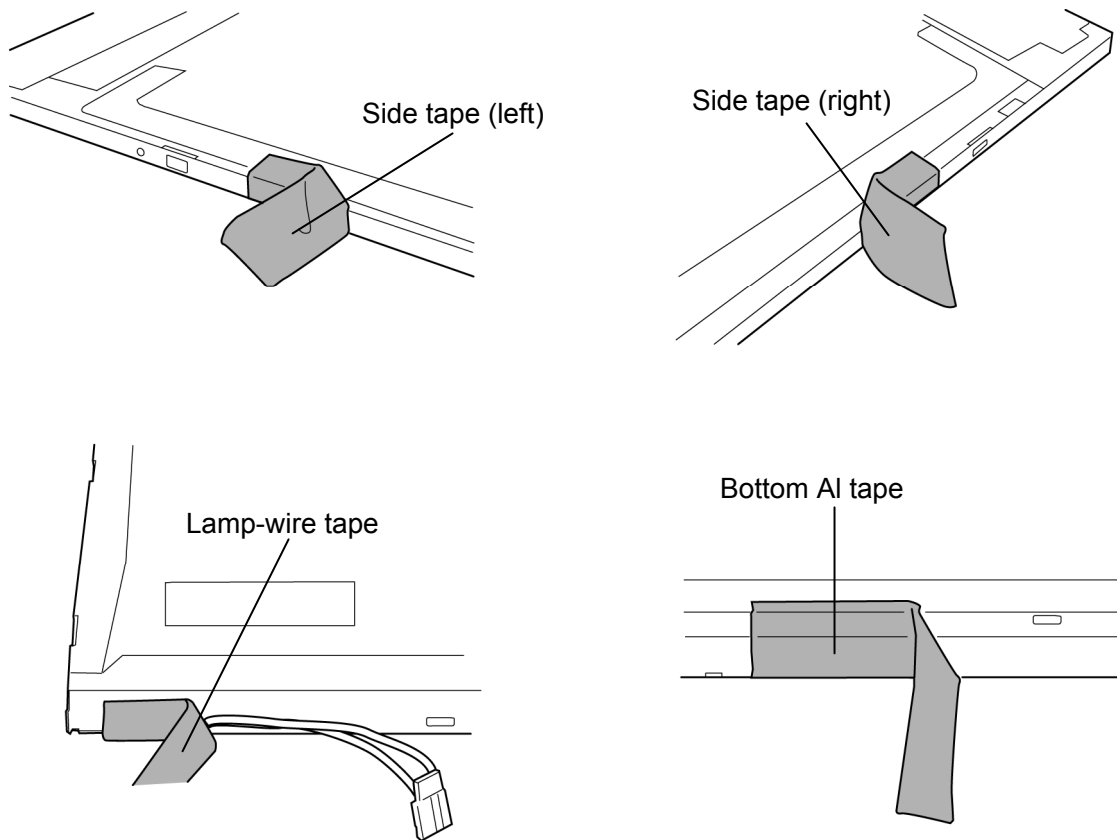


Figure 4-61 Replacing Samsung fluorescent lamp (WXGA) (2)

3. Separate the top chassis from the molded frame.

CAUTION: Separate in the order of bottom hook and side hook (left and right).

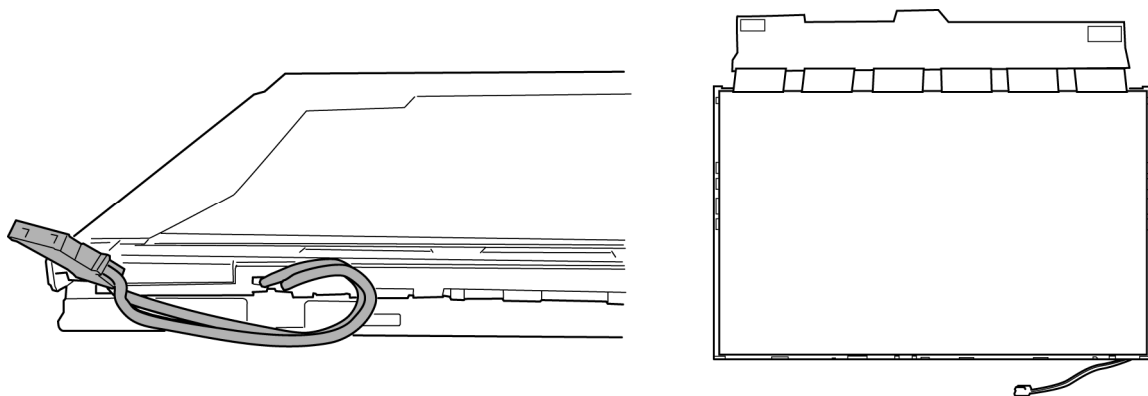


Figure 4-62 Replacing Samsung fluorescent lamp (WXGA) (3)

4. Separate the panel assembly from backlight unit.

CAUTION: Handle with care not to damage COF of S/D.

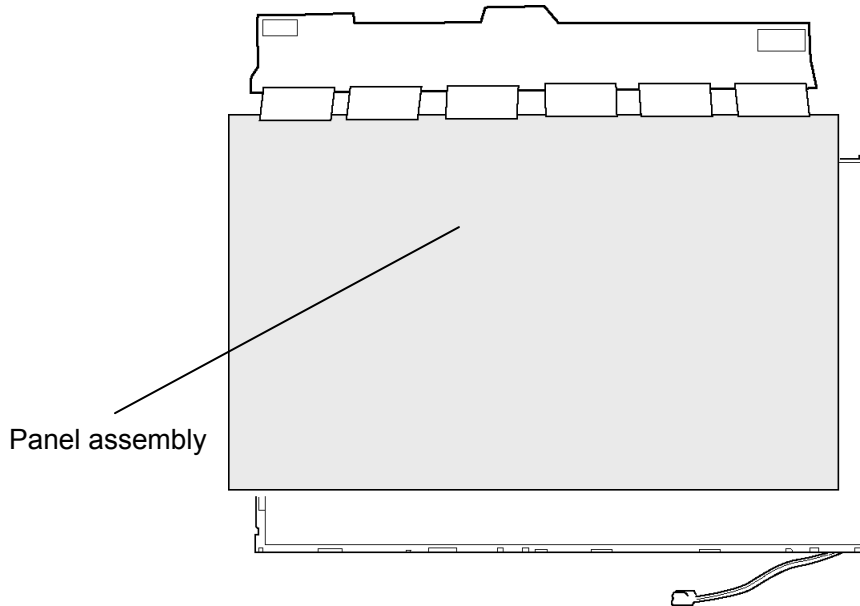


Figure 4-63 Replacing Samsung fluorescent lamp (WXGA) (4)

Assembling the fluorescent lamp

The assembly procedure of the 15.4-inch Samsung fluorescent lamp is the reverse of the above disassembly procedure. Refer to figures 4-60 to 4-63.

1. Install the panel assembly on the backlight unit.
2. Install the top chassis on the molded frame.
3. Stick the side tapes and Al tape.
4. Stick the PCB cover.

4.28.3 Replacing the 14.1-inch WXGA+ LG Philips Fluorescent Lamp

CAUTION: When replacing the fluorescent lamp, wear finger covers or gloves to avoid contaminating or damaging the LCD panel. Be careful not to let dust or other foreign substance into the module.

To replace the 14.1-inch WXGA+ LG Philips fluorescent lamp, follow the steps below and refer to Figure 4-64 to 4-71.

Disassembly of outside tape / Cover shield

1. Disassembly of Tape Adhesive used for B/L Wire fixing.
2. Disassembly of Tape Adhesive used for Top case fixing.

CAUTION: Pressure or stress should not be given on Top case during this process.

3. Disassembly of Cover shield (G).

CAUTION: Pressure or stress should not be given on Gate COF.

4. Disassembly of Cover shield (S).

CAUTION: Pressure or stress should not be given on Source PCB.
Usage of gloves with anti-electric discharge coating is recommended.
To eliminate possible damage on circuits occurred by ESC.

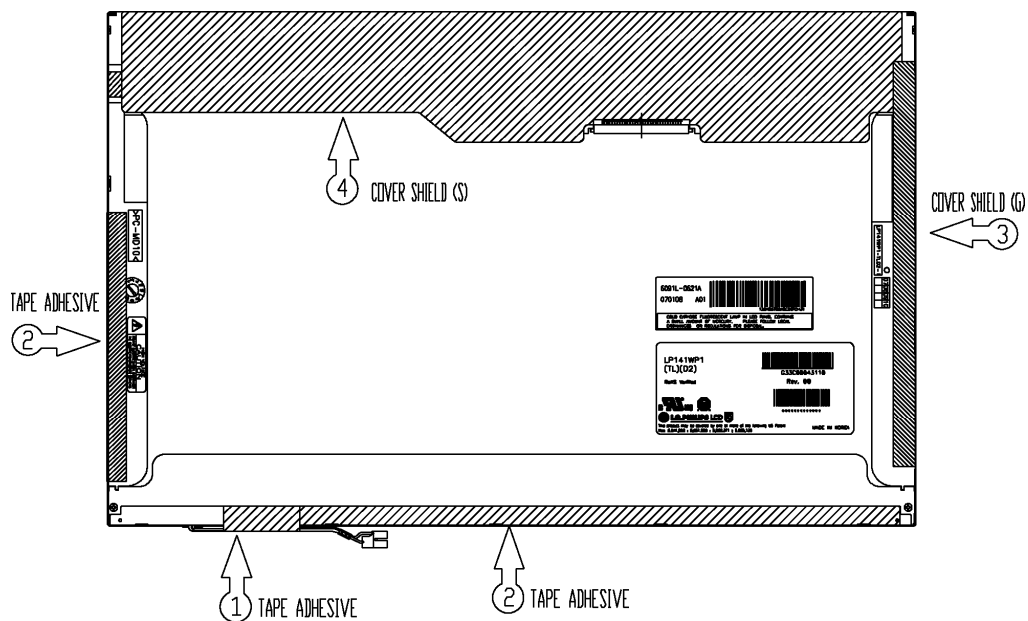


Figure 4-64 Replacing LG.Philips fluorescent lamp (WXGA+) (1)

Disassembly of Top Case

1. Disassembly of Top Case.

CAUTION: Pressure or stress should not be given on PCB and COF.

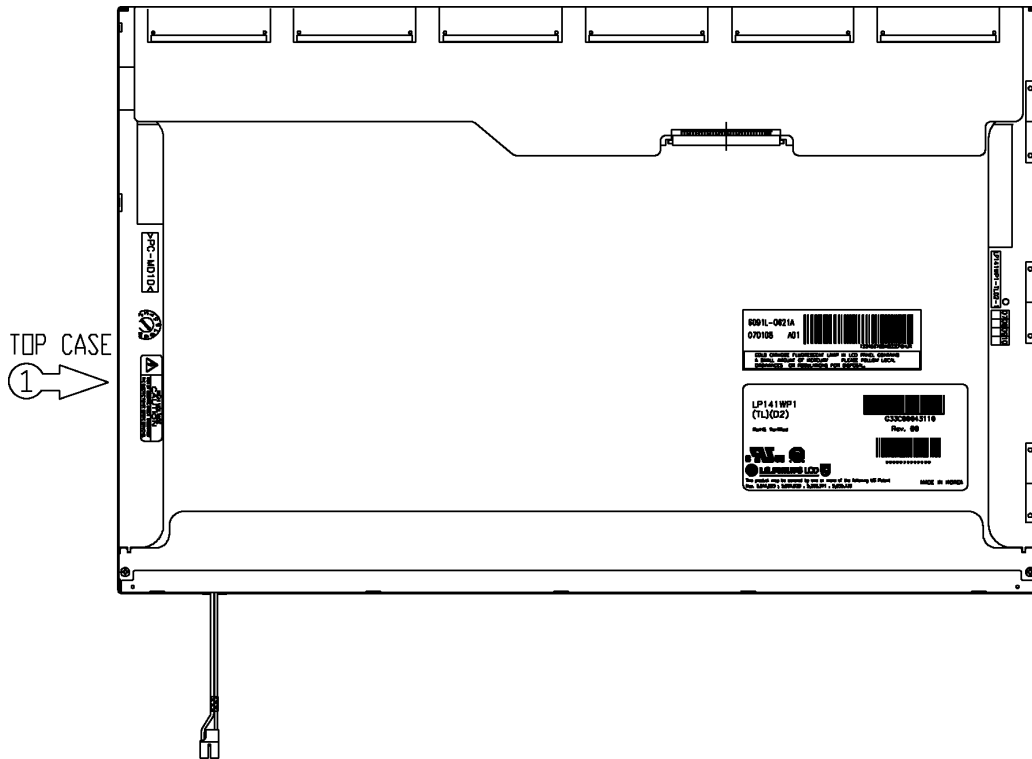


Figure 4-65 Replacing LG.Philips fluorescent lamp (WXGA+) (2)

Disassembly of Source PCB

1. Disassembly of Source PCB.

CAUTION: Pressure or stress should not be given on PCB and COF.

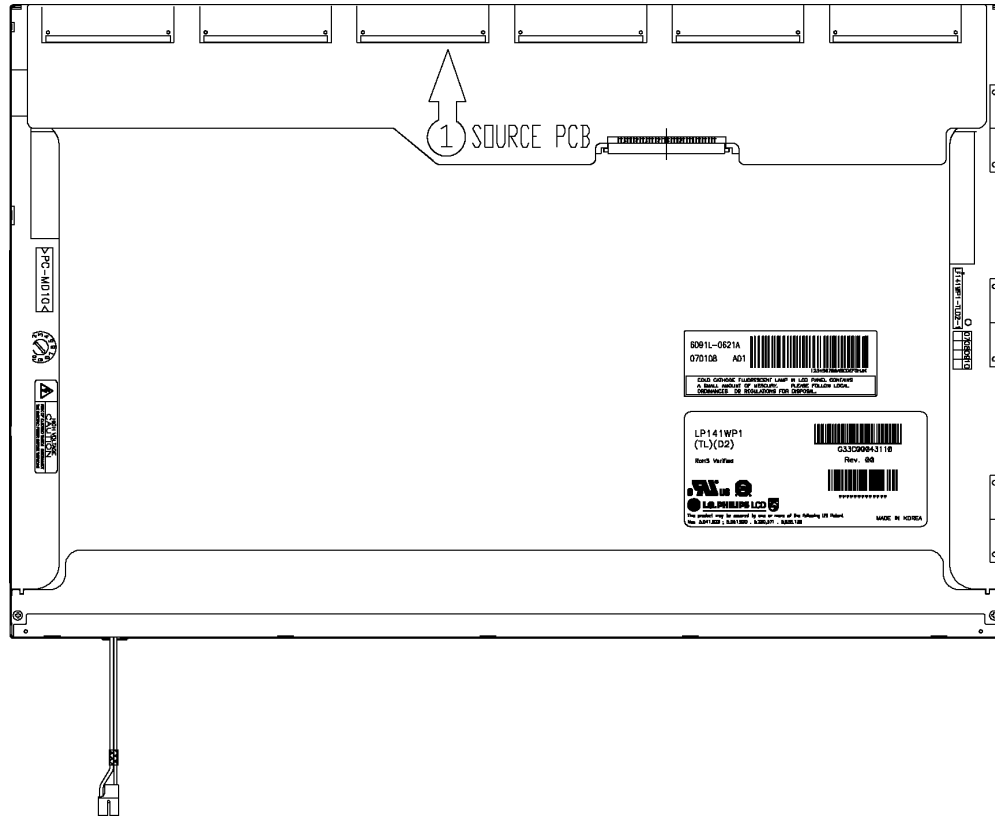


Figure 4-66 Replacing LG.Philips fluorescent lamp (WXGA+) (3)

Disassembly of Board Ass'y, Tape Adhesive, Sheets, Light guide, Cover Ass'y Bottom (L)

1. Disassembly of Board Ass'y.

CAUTION: This process should be made in Clean room with no scratch nor particle on Polarizer and B/L Ass'y.

2. Disassembly of Tape Adhesive used for Sheets fixing (4 Points).
3. Disassembly of Sheets and Light guide.

CAUTION: No penetration of foreign body is indispensable with no scratch on the surface of each Sheets.

4. Disassembly of Screw (2 Points) and Cover Ass'y Bottom (L).

CAUTION: Maximum value of torque with Screw should be below 2.5kgf.cm.

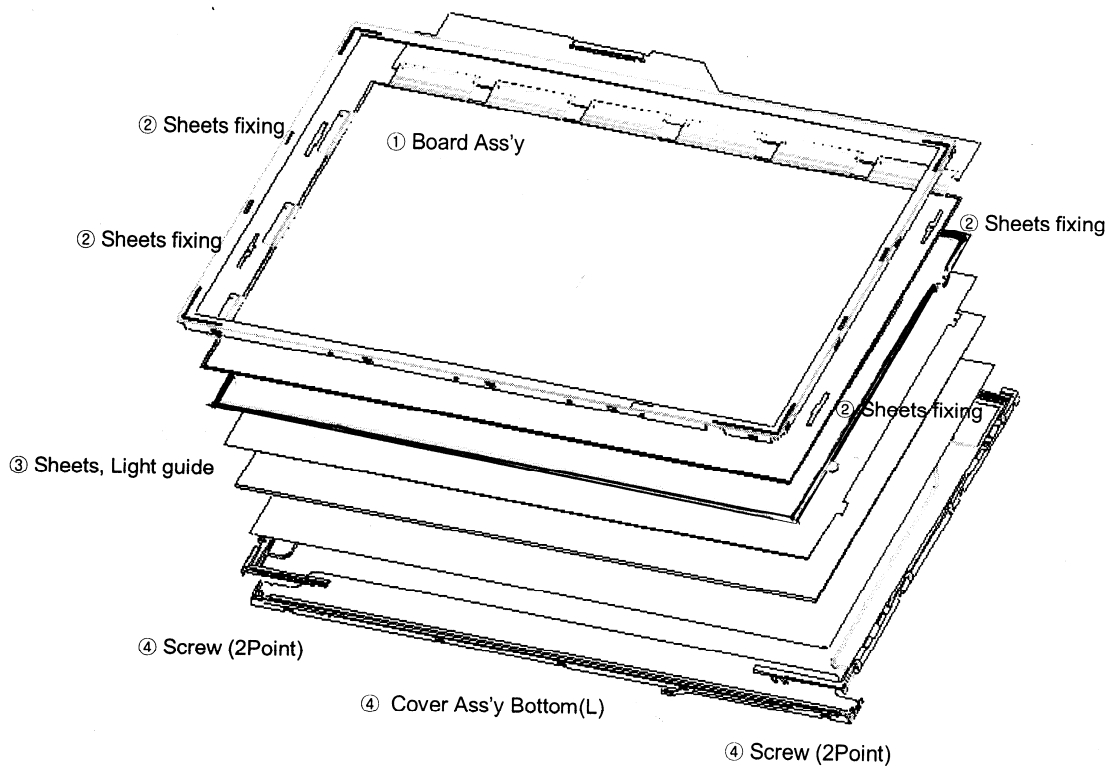


Figure 4-67 Replacing LG.Philips fluorescent lamp (WXGA+) (4)

Assembly of Cover Ass'y Bottom (L), Sheets, Light guide, Tape Adhesive and Board Ass'y

1. Detach a release paper from Double Tape at the Cover Ass'y Bottom (L).
2. Assembly of Cover Ass'y Bottom (L) and Screw (2 Points).

CAUTION: Maximum value of torque with Screw should be below 2.5kgf.cm.

3. Assembly of Light Guide and Sheets.

CAUTION: No penetration of foreign body is indispensable with no scratch on the surface of each Sheet and Light guide.

4. Assembly of Tape adhesive used for Sheets fixing (4 Points).
5. Assembly of Board Ass'y.

CAUTION: Pressure or stress should not be given on PCB and TCP.

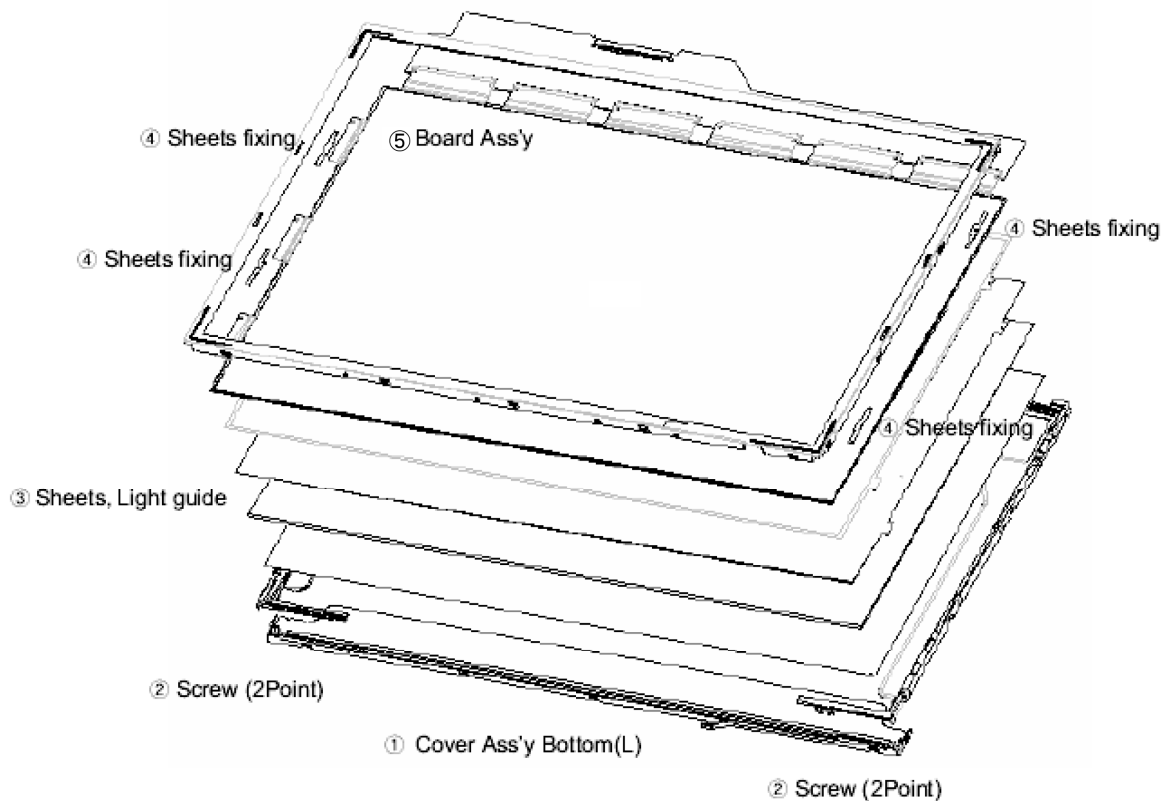


Figure 4-68 Replacing LG.Philips fluorescent lamp (WXGA+) (5)

Assembly of Source PCB

1. Assembly of Source PCB.

CAUTION: Stress should not be given on COF.

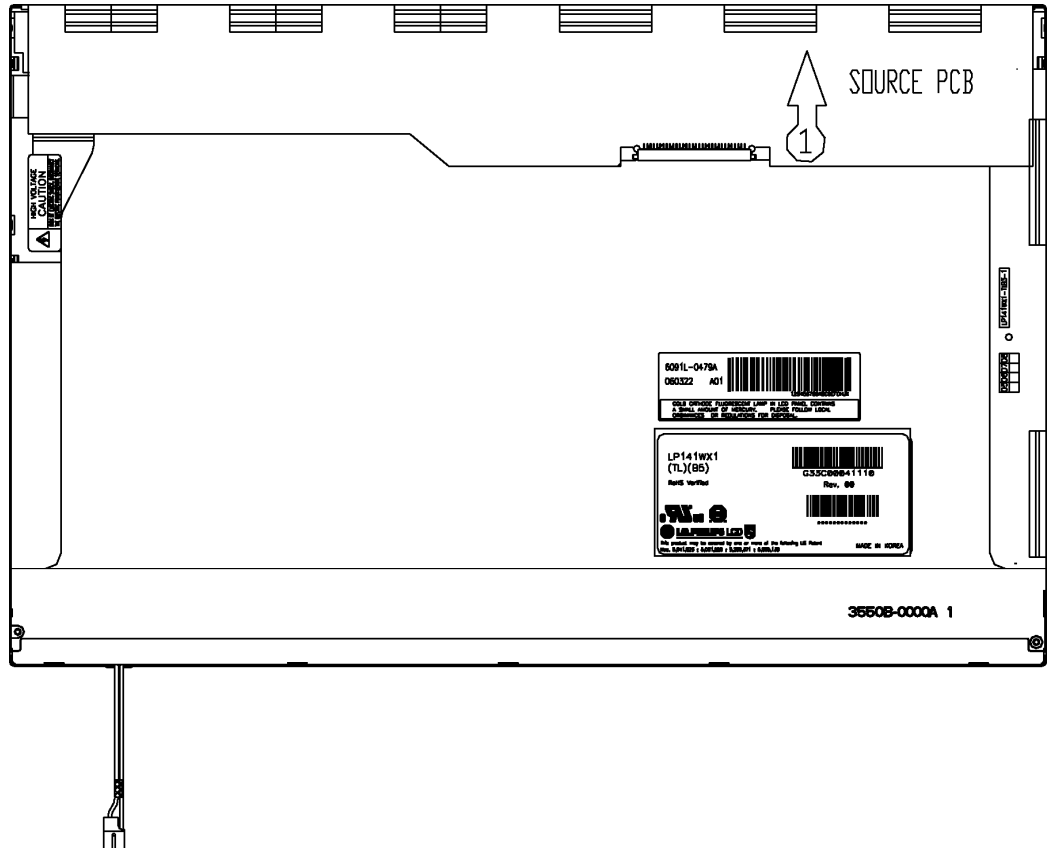


Figure 4-69 Replacing LG.Philips fluorescent lamp (WXGA+) (6)

Assembly of Top Case

1. Assembly of Top Case.

CAUTION: Pressure should not be given on PCB and COF.

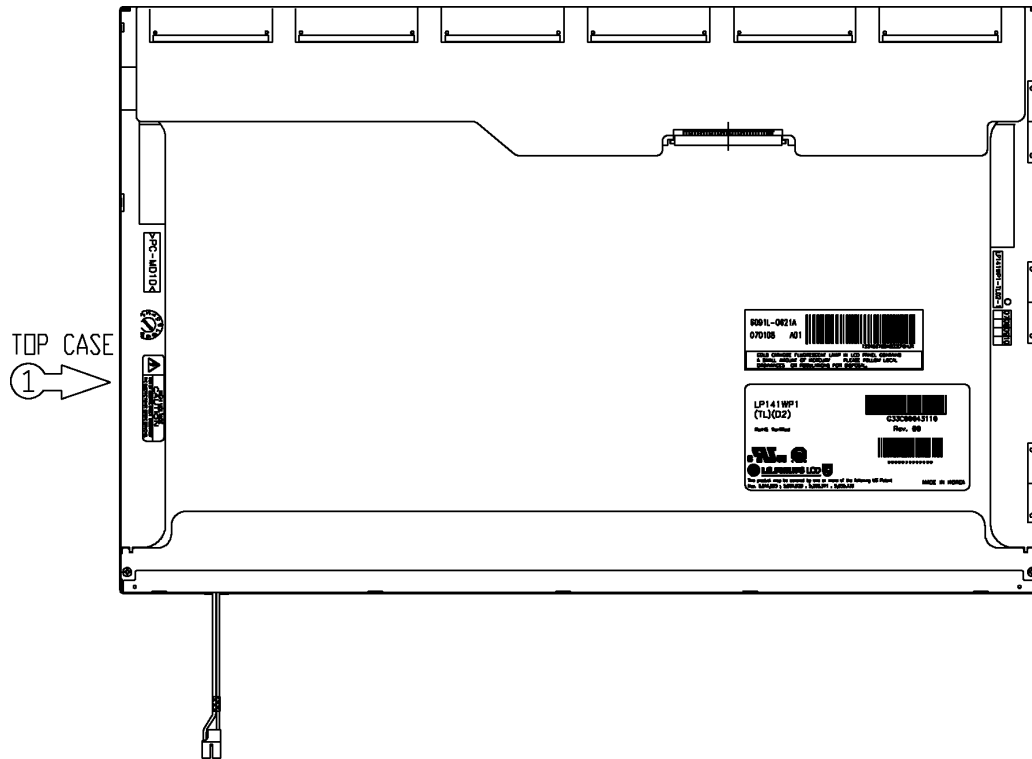


Figure 4-70 Replacing LG.Philips fluorescent lamp (WXGA+) (7)

Assembly of Source PCB

1. Assembly of Source PCB & Cover shield(S).

CAUTION: Pressure or stress should not be given on Source COF & Source PCB.
Usage of gloves with anti-electric discharge coating is recommended.
To eliminate possible damage on circuits occurred by ESC.

2. Assembly of Cover shield (G).

CAUTION: Pressure or stress should not be given on Gate COF.

3. Assembly of Tape Adhesive used for Top case fixing.
4. Assembly of Tape Adhesive used for B/L Wire fixing.

CAUTION: Pressure or stress should not be given on Top case during this process.

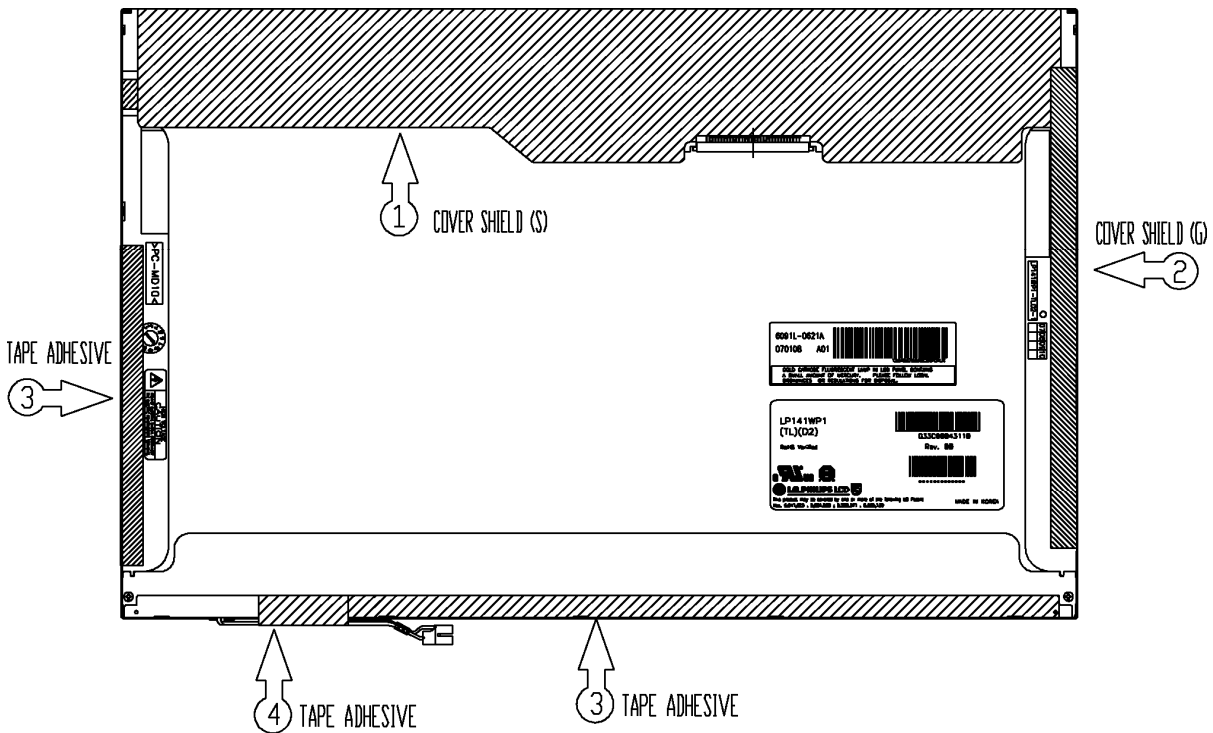


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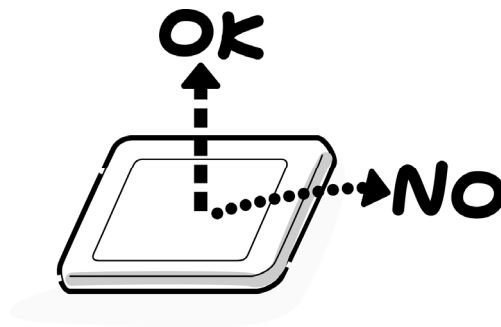
Table I-1 MTBF I-1

Appendix A Handling the LCD Module

Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling the LCD module:

1. When installing the LCD module in the LCD cover, be sure to seat it so that it is properly aligned and maximum visibility of the display is maintained.



2. For the LCD module, be careful to align the four holes at the right side and left side of the LCD module with the corresponding holes in the LCD cover before securing the module with four screws.

Do not force the module into place, because stress can affect its performance. Also, the panel's polarized surface is easily scarred, so be carefully when handling it.



3. If the panel's surface gets dirty, wipe it with cotton or a soft cloth. If it is still dirty, try breathing on the surface to create a light condensate and wipe it again.

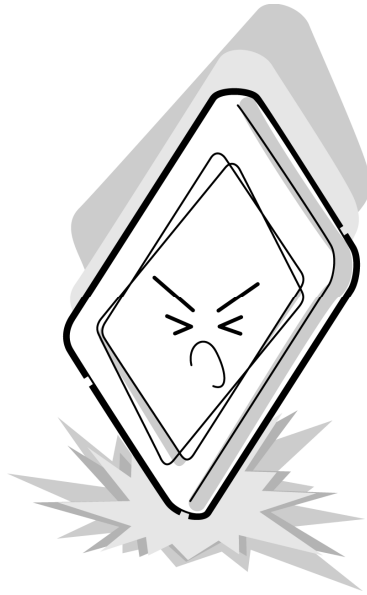
If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel.



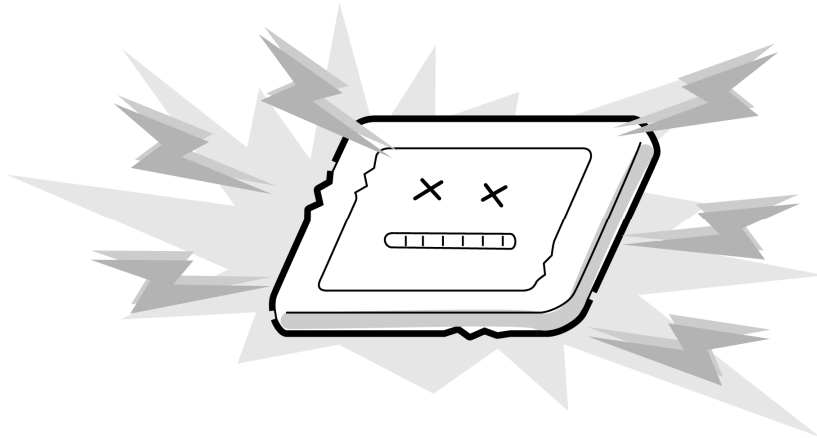
4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.



5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



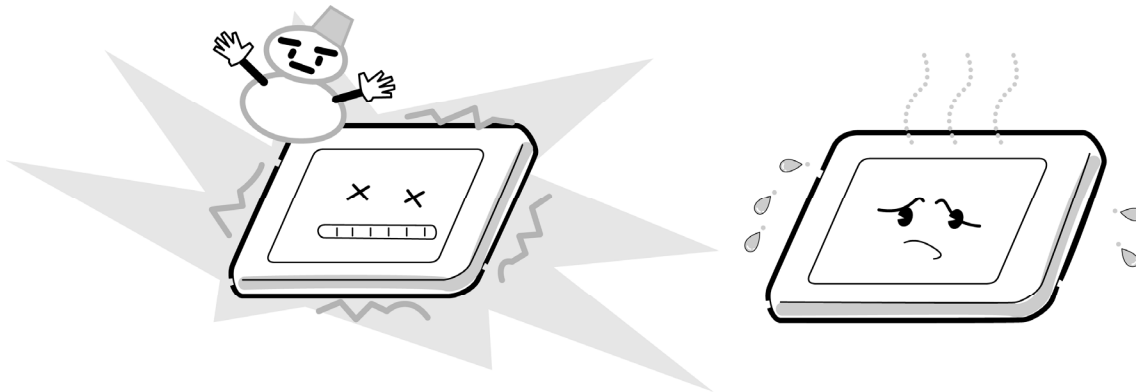
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.



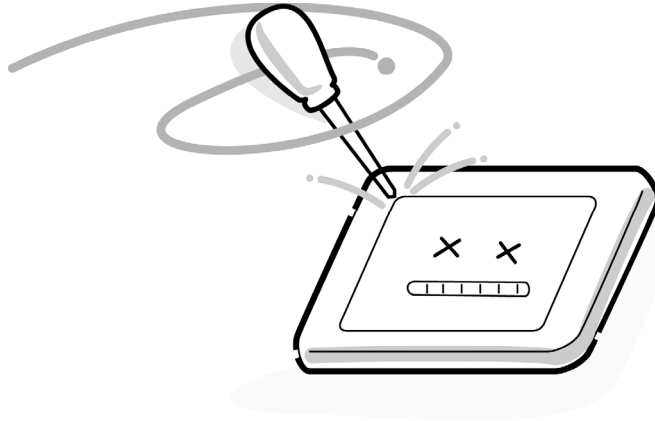
7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.



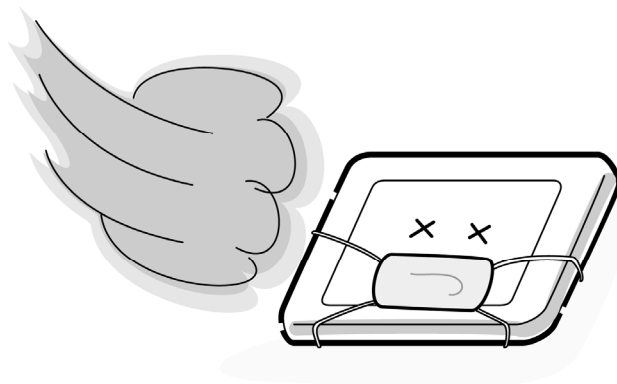
8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.



9. Do not disassemble the LCD module. Disassembly can cause malfunctions.



10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxime). These materials can release gas that can damage the panel's polarization.



Appendix B Board Layout

B.1 System Board (FNPSY*) Front View

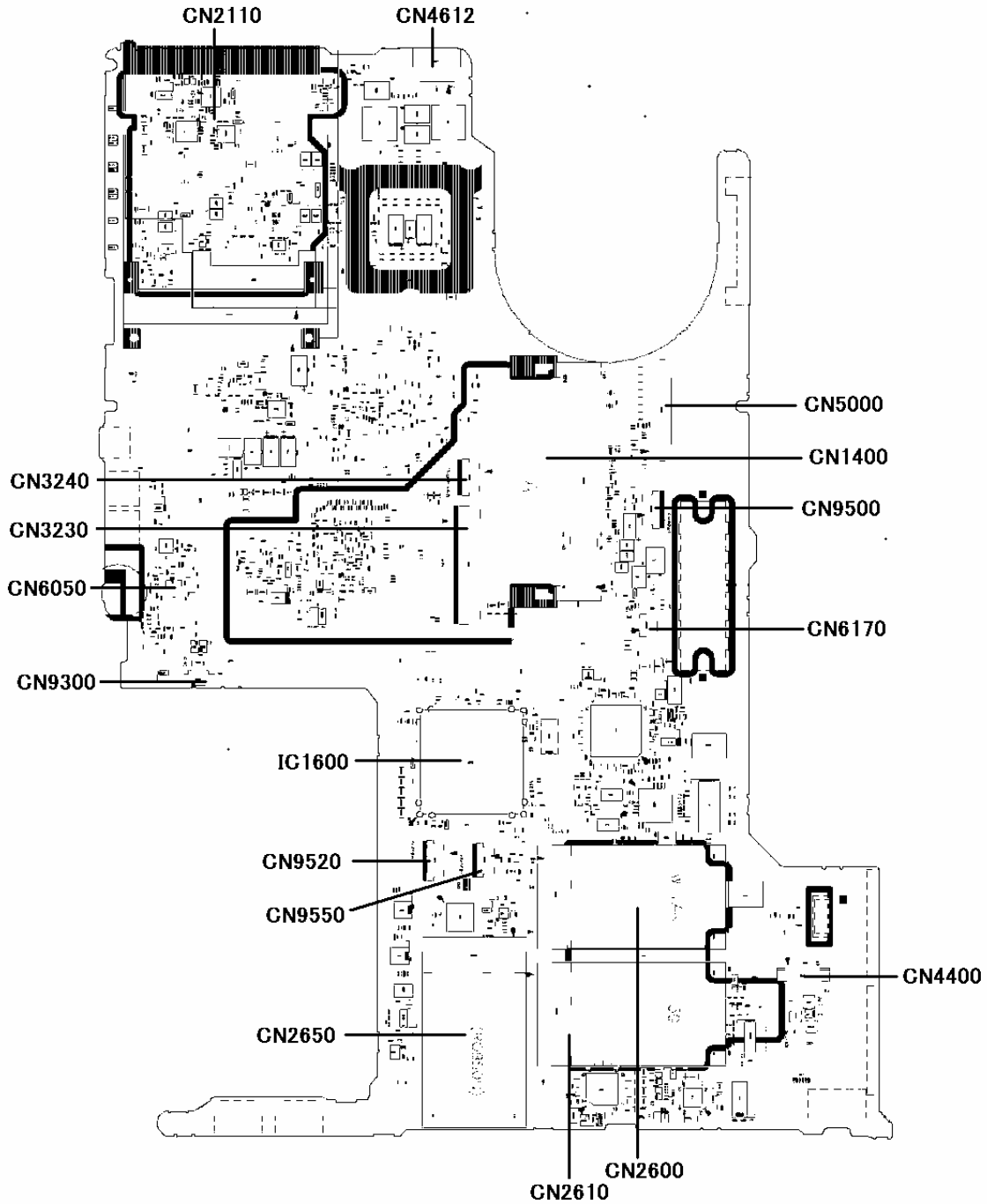


Figure B-1 System board (FNPSY*) layout (front)

Table B-1 System board (FNPSY*) ICs and connectors (front)

| Number | Name |
|--------|---|
| CN1400 | SO-DIMM0 connector |
| IC1600 | Intel ICH8M (South Bridge) |
| CN2110 | PC card interface connector |
| CN2600 | Mini PCI Express interface connector (Wireless LAN) |
| CN2610 | Mini PCI Express interface connector (3G: not used) |
| CN2650 | Mini PCI Express interface connector (Robson: not used) |
| CN3230 | Keyboard interface connector |
| CN3240 | Dual Point interface connector |
| CN4400 | Bluetooth interface connector |
| CN4612 | USB port 0 connector |
| CN5000 | LCD interface connector |
| CN6050 | Internal microphone connector |
| CN6170 | Speaker connector |
| CN9300 | RTC Battery connector |
| CN9500 | Switch board interface connector |
| CN9520 | SIM interface connector(not used) |
| CN9550 | Fingerprint sensor board interface connector |

B.2 System Board (FNPSY *) Back View

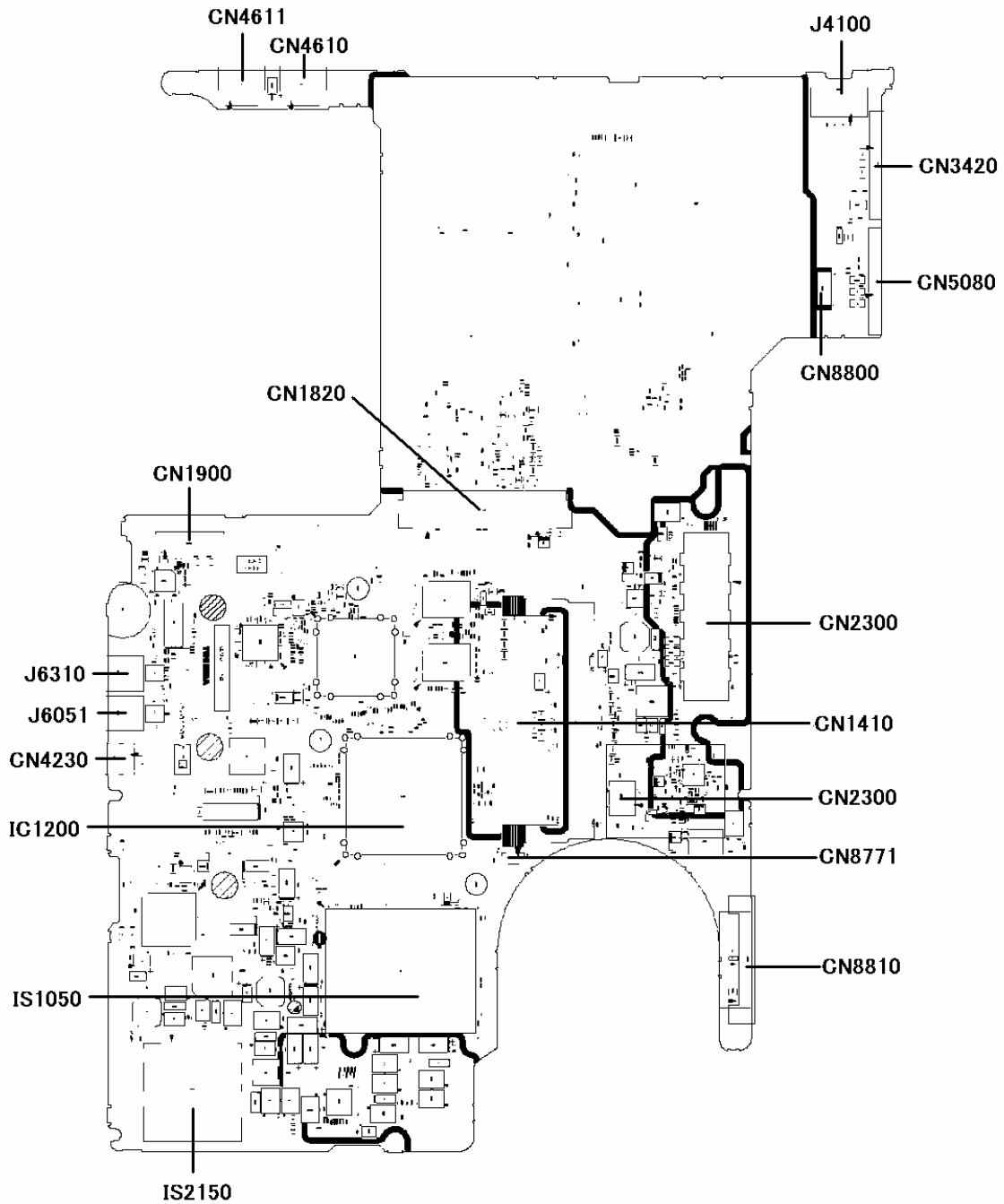
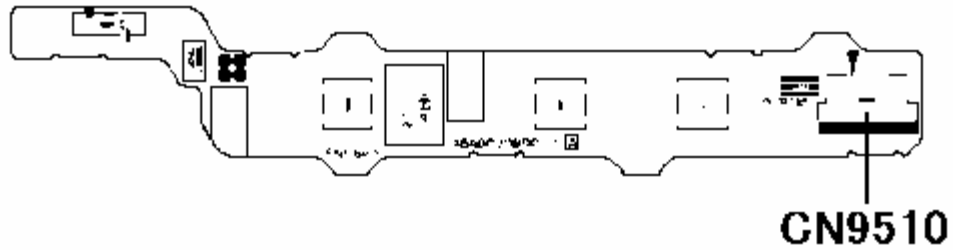


Figure B-2 System board (FNPSY*) layout (back)

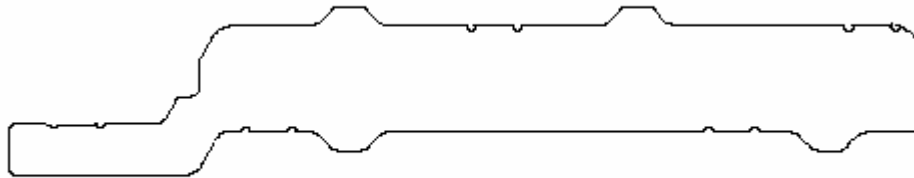
Table B-2 System board FNPSY*) connectors (back)

| Number | Name |
|--------|-----------------------------------|
| IS1050 | CPU socket |
| IC1200 | Intel Crestline-GM (North Bridge) |
| CN1410 | SO-DIMM1 connector |
| CN1820 | Select bay interface connector |
| CN1900 | HDD(SATA) interface connector |
| IS2150 | SD card interface connector |
| CN2300 | Docking interface connector |
| CN3010 | MDC interface connector |
| CN3420 | Serial connector |
| J4100 | LAN interface connector |
| CN4230 | IEEE 1394 interface connector |
| CN4610 | USB port 6 connector |
| CN4611 | USB port 4 connector |
| CN5080 | RGB connector |
| J6051 | External microphone connector |
| J6310 | Headphone connector |
| CN8800 | DC-IN connector |
| CN8810 | Main Battery connector |
| CN8771 | FAN interface connector |

B.3 Switch Board (FNPSW*) Front and Back View



(front)



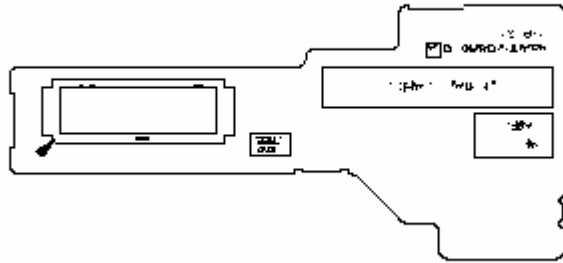
(back)

Figure B-3 SwitchBoard (FNPSW*) layout (front/back)

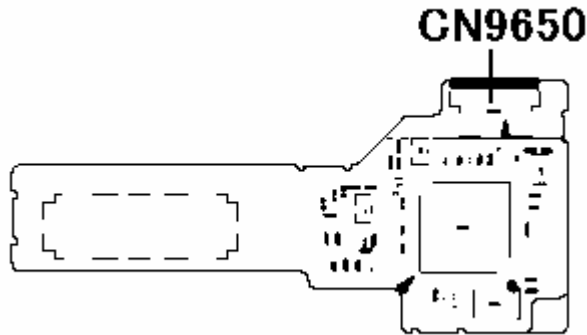
Table B-3 SwitchBoard (FNPSW*) connectors (front/back)

| Number | Name |
|--------|----------------------------|
| CN9510 | System board I/F connector |

B.4 Fingerprint sensor Board (FNPFS*) Front and Back View



(front)



(back)

Figure B-4 Fingerprint sensor Board (FNPFS*) layout (front/back)

Table B-4 Fingerprint sensor Board (FNPFS*) connector (front)

| Number | Name |
|--------|----------------------------------|
| CN9610 | System board interface connector |

Appendix C

Appendix C Pin Assignments

System board

C.1 CN1400 SO-DIMM0 connector (200-pin)

Table C-1 SO-DIMM0 connector (200-pin) (1/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|--------------------|-----|
| 1 | MRVREF-B0V | I | 2 | GND | - |
| 3 | GND | - | 4 | ADQ04-B1P | I/O |
| 5 | ADQ00-B1P | I/O | 6 | ADQ06-B1P | I/O |
| 7 | ADQ05-B1P | I/O | 8 | GND | - |
| 9 | GND | - | 10 | ADM0-B1P | I/O |
| 11 | ADQS0-B1N | I/O | 12 | GND | - |
| 13 | ADQS0-B1P | I/O | 14 | ADQ07-B1P | I/O |
| 15 | GND | - | 16 | ADQ01-B1P | I/O |
| 17 | ADQ03-B1P | I/O | 18 | GND | - |
| 19 | ADQ02-B1P | I/O | 20 | ADQ08-B1P | I/O |
| 21 | GND | - | 22 | ADQ12-B1P | I/O |
| 23 | ADQ14-B1P | I/O | 24 | GND | - |
| 25 | ADQ13-B1P | I/O | 26 | ADM1-B1P | I |
| 27 | GND | - | 28 | GND | - |
| 29 | ADQS1-B1N | I/O | 30 | XMCK0-B1P | I |
| 31 | ADQS1-B1P | I/O | 32 | XMCK0-B1N | I |
| 33 | GND | - | 34 | GND | - |
| 35 | ADQ15-B1P | I/O | 36 | ADQ09-B1P | I/O |
| 37 | ADQ11-B1P | I/O | 38 | ADQ10-B1P | I/O |
| 39 | GND | - | 40 | GND | - |
| 41 | GND | - | 42 | GND | - |
| 43 | ADQ21-B1P | I/O | 44 | ADQ16-B1P | I/O |
| 45 | ADQ20-B1P | I/O | 46 | ADQ17-B1P | I/O |
| 47 | GND | - | 48 | GND | - |
| 49 | ADQS2-B1N | I/O | 50 | TSDIMA-P3N (NC) | - |
| 51 | ADQS2-B1P | I/O | 52 | ADM2-B1P | I |
| 53 | GND | - | 54 | GND | - |
| 55 | ADQ18-B1P | I/O | 56 | ADQ19-B1P | I/O |
| 57 | ADQ23-B1P | I/O | 58 | ADQ22-B1P | I/O |
| 59 | GND | - | 60 | GND | - |
| 61 | ADQ28-B1P | I/O | 62 | ADQ25-B1P | I/O |

Table C-1 SO-DIMM0 connector (200-pin) (2/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 63 | ADQ29-B1P | I/O | 64 | ADQ24-B1P | I/O |
| 65 | GND | - | 66 | GND | - |
| 67 | ADM3-B1P | I | 68 | ADQS3-B1N | I/O |
| 69 | N.C. | - | 70 | ADQS3-B1P | I/O |
| 71 | GND | - | 72 | GND | - |
| 73 | ADQ30-B1P | I/O | 74 | ADQ31-B1P | I/O |
| 75 | ADQ27-B1P | I/O | 76 | ADQ26-B1P | I/O |
| 77 | GND | - | 78 | GND | - |
| 79 | MCKE0-B1P | I | 80 | MCKE1-B1P | I |
| 81 | 1R8-B1V | I | 82 | 1R8-B1V | I |
| 83 | N.C. | - | 84 | N.C | - |
| 85 | ABS2-B1P | I | 86 | AMA14-B1P | I |
| 87 | 1R8-B1V | I | 88 | 1R8-B1V | I |
| 89 | AMA12-B1P | I | 90 | AMA11-B1P | I |
| 91 | AMA09-B1P | I | 92 | AMA07-B1P | I |
| 93 | AMA08-B1P | I | 94 | AMA06-B1P | I |
| 95 | 1R8-B1V | I | 96 | 1R8-B1V | I |
| 97 | AMA05-B1P | I | 98 | AMA04-B1P | I |
| 99 | AMA03-B1P | I | 100 | AMA02-B1P | I |
| 101 | AMA01-B1P | I | 102 | AMA00-B1P | I |
| 103 | 1R8-B1V | I | 104 | 1R8-B1V | I |
| 105 | AMA10-B1P | I | 106 | ABS1-B1P | I |
| 107 | ABS0-B1P | I | 108 | ARAS-B1N | I |
| 109 | AWE-B1N | I | 110 | MCS0-B1N | I |
| 111 | 1R8-B1V | I | 112 | 1R8-B1V | I |
| 113 | ACAS-B1N | I | 114 | MODT0-B1P | I |
| 115 | MCS1-B1N | I | 116 | AMA13-B1P | I |
| 117 | 1R8-B1V | I | 118 | 1R8-B1V | I |
| 119 | MODT1-B1P | I | 120 | N.C. | - |
| 121 | GND | - | 122 | GND | - |
| 123 | ADQ36-B1P | I/O | 124 | ADQ35-B1P | I/O |
| 125 | ADQ32-B1P | I/O | 126 | ADQ33-B1P | I/O |
| 127 | GND | - | 128 | GND | - |
| 129 | ADQS4-B1N | I/O | 130 | ADM4-B1P | I |
| 131 | ADQS4-B1P | I/O | 132 | GND | - |

Table C-1 SO-DIMM0 connector (200-pin) (3/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 133 | GND | - | 134 | ADQ37-B1P | I/O |
| 135 | ADQ38-B1P | I/O | 136 | ADQ34-B1P | I/O |
| 137 | ADQ39-B1P | I/O | 138 | GND | - |
| 139 | GND | - | 140 | ADQ41-B1P | I/O |
| 141 | ADQ44-B1P | I/O | 142 | ADQ45-B1P | I/O |
| 143 | ADQ40-B1P | I/O | 144 | GND | - |
| 145 | GND | - | 146 | ADQS5-B1N | I/O |
| 147 | ADM5-B1P | I | 148 | ADQS5-B1P | I/O |
| 149 | GND | - | 150 | GND | - |
| 151 | ADQ42-B1P | I/O | 152 | ADQ47-B1P | I/O |
| 153 | ADQ46-B1P | I/O | 154 | ADQ43-B1P | I/O |
| 155 | GND | - | 156 | GND | - |
| 157 | ADQ49-B1P | I/O | 158 | ADQ48-B1P | I/O |
| 159 | ADQ52-B1P | I/O | 160 | ADQ53-B1P | I/O |
| 161 | GND | - | 162 | GND | - |
| 163 | N.C. | - | 164 | XMCK1-B1P | I |
| 165 | GND | - | 166 | XMCK1-B1N | I |
| 167 | ADQS6-B1N | I/O | 168 | GND | - |
| 169 | ADQS6-B1P | I/O | 170 | ADM6-B1P | I |
| 171 | GND | - | 172 | GND | - |
| 173 | ADQ51-B1P | I/O | 174 | ADQ55-B1P | I/O |
| 175 | ADQ50-B1P | I/O | 176 | ADQ54-B1P | I/O |
| 177 | GND | - | 178 | GND | - |
| 179 | ADQ58-B1P | I/O | 180 | ADQ61-B1P | I/O |
| 181 | ADQ62-B1P | I/O | 182 | ADQ60-B1P | I/O |
| 183 | GND | - | 184 | GND | - |
| 185 | ADM7-B1P | I | 186 | ADQS7-B1N | I/O |
| 187 | GND | - | 188 | ADQS7-B1P | I/O |
| 189 | ADQ59-B1P | I/O | 190 | GND | - |
| 191 | ADQ63-B1P | I/O | 192 | ADQ56-B1P | I/O |
| 193 | GND | - | 194 | ADQ57-B1P | I/O |
| 195 | SMBDT1-E3P | I/O | 196 | GND | - |
| 197 | SMBCK1-E3P | I/O | 198 | GND | - |
| 199 | M-E3V | I | 200 | GND | I |
| 1T | GND | - | 2T | GND | - |
| 3T | GND | - | 4T | GND | - |

C.2 CN1410 SO-DIMM1 connector (200-pin)*Table C-2 SO-DIMM1 connector (200-pin) (1/3)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|--------------------|-----|
| 1 | MRVREF-B0V | I | 2 | GND | - |
| 3 | GND | - | 4 | BDQ01-B1P | I/O |
| 5 | BDQ04-B1P | I/O | 6 | BDQ00-B1P | I/O |
| 7 | BDQ05-B1P | I/O | 8 | GND | - |
| 9 | GND | - | 10 | BDM0-B1P | I |
| 11 | BDQS0-B1N | I/O | 12 | GND | - |
| 13 | BDQS0-B1P | I/O | 14 | BDQ07-B1P | I/O |
| 15 | GND | - | 16 | BDQ06-B1P | I/O |
| 17 | BDQ03-B1P | I/O | 18 | GND | - |
| 19 | BDQ02-B1P | I/O | 20 | BDQ11-B1P | I/O |
| 21 | GND | - | 22 | BDQ08-B1P | I/O |
| 23 | BDQ13-B1P | I/O | 24 | GND | - |
| 25 | BDQ12-B1P | I/O | 26 | BDM1-B1P | I |
| 27 | GND | - | 28 | GND | - |
| 29 | BDQS1-B1N | I/O | 30 | XMCK3-B1P | I |
| 31 | BDQS1-B1P | I/O | 32 | XMCK3-B1N | I |
| 33 | GND | - | 34 | GND | - |
| 35 | BDQ10-B1P | I/O | 36 | BDQ15-B1P | I/O |
| 37 | BDQ09-B1P | I/O | 38 | BDQ14-B1P | I/O |
| 39 | GND | - | 40 | GND | - |
| 41 | GND | - | 42 | GND | - |
| 43 | BDQ21-B1P | I/O | 44 | BDQ16-B1P | I/O |
| 45 | BDQ22-B1P | I/O | 46 | BDQ20-B1P | I/O |
| 47 | GND | - | 48 | GND | - |
| 49 | BDQS2-B1N | I/O | 50 | TSDIMB-P3N (NC) | - |
| 51 | BDQS2-B1P | I/O | 52 | BDM2-B1P | I |
| 53 | GND | - | 54 | GND | - |
| 55 | BDQ19-B1P | I/O | 56 | BDQ23-B1P | I/O |
| 57 | BDQ17-B1P | I/O | 58 | BDQ18-B1P | I/O |
| 59 | GND | - | 60 | GND | - |
| 61 | BDQ24-B1P | I/O | 62 | BDQ25-B1P | I/O |

Table C-2 SO-DIMM1 connector (200-pin) (2/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 63 | BDQ29-B1P | I/O | 64 | BDQ28-B1P | I/O |
| 65 | GND | - | 66 | GND | - |
| 67 | BDM3-B1P | I | 68 | BDQS3-B1N | I/O |
| 69 | N.C. | - | 70 | BDQS3-B1P | I/O |
| 71 | GND | - | 72 | GND | - |
| 73 | BDQ31-B1P | I/O | 74 | BDQ27-B1P | I/O |
| 75 | BDQ30-B1P | I/O | 76 | BDQ26-B1P | I/O |
| 77 | GND | - | 78 | GND | - |
| 79 | MCKE3-B1P | I | 80 | MCKE4-B1P | I |
| 81 | 1R8-B1V | I | 82 | 1R8-B1V | I |
| 83 | N.C. | - | 84 | N.C | - |
| 85 | BBS2-B1P | I | 86 | BMA14-B1P | - |
| 87 | 1R8-B1V | I | 88 | 1R8-B1V | I |
| 89 | BMA12-B1P | I | 90 | BMA11-B1P | I |
| 91 | BMA09-B1P | I | 92 | BMA07-B1P | I |
| 93 | BMA08-B1P | I | 94 | BMA06-B1P | I |
| 95 | 1R8-B1V | I | 96 | 1R8-B1V | I |
| 97 | BMA05-B1P | I | 98 | BMA04-B1P | I |
| 99 | BMA03-B1P | I | 100 | BMA02-B1P | I |
| 101 | BMA01-B1P | I | 102 | BMA00-B1P | I |
| 103 | 1R8-B1V | I | 104 | 1R8-B1V | I |
| 105 | BMA10-B1P | I | 106 | BBS1-B1P | I |
| 107 | BBS0-B1P | I | 108 | BRAS-B1N | I |
| 109 | BWE-B1N | I | 110 | MCS2-B1N | I |
| 111 | 1R8-B1V | I | 112 | 1R8-B1V | I |
| 113 | BCAS-B1N | I | 114 | MODT2-B1P | I |
| 115 | MCS3-B1N | I | 116 | BMA13-B1P | I |
| 117 | 1R8-B1V | I | 118 | 1R8-B1V | I |
| 119 | MODT3-B1P | I | 120 | N.C | - |
| 121 | GND | - | 122 | GND | - |
| 123 | BDQ38-B1P | I/O | 124 | BDQ39-B1P | I/O |
| 125 | BDQ36-B1P | I/O | 126 | BDQ37-B1P | I/O |
| 127 | GND | - | 128 | GND | - |
| 129 | BDQS4-B1N | I/O | 130 | BDM4-B1P | I |
| 131 | BDQS4-B1P | I/O | 132 | GND | - |
| 133 | GND | - | 134 | BDQ34-B1P | I/O |

Table C-2 SO-DIMM1 connector (200-pin) (3/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 135 | BDQ35-B1P | I/O | 136 | BDQ32-B1P | I/O |
| 137 | BDQ33-B1P | I/O | 138 | GND | - |
| 139 | GND | - | 140 | BDQ43-B1P | I/O |
| 141 | BDQ40-B1P | I/O | 142 | BDQ46-B1P | I/O |
| 143 | BDQ45-B1P | I/O | 144 | GND | - |
| 145 | GND | - | 146 | BDQS5-B1N | I/O |
| 147 | BDM5-B1P | I | 148 | BDQS5-B1P | I/O |
| 149 | GND | - | 150 | GND | - |
| 151 | BDQ47-B1P | I/O | 152 | BDQ42-B1P | I/O |
| 153 | BDQ41-B1P | I/O | 154 | BDQ44-B1P | I/O |
| 155 | GND | - | 156 | GND | - |
| 157 | BDQ52-B1P | I/O | 158 | BDQ55-B1P | I/O |
| 159 | BDQ49-B1P | I/O | 160 | BDQ50-B1P | I/O |
| 161 | GND | - | 162 | GND | - |
| 163 | N.C. | - | 164 | XMCK4-B1P | I |
| 165 | GND | - | 166 | XMCK4-B1N | I |
| 167 | BDQS6-B1N | I/O | 168 | GND | - |
| 169 | BDQS6-B1P | I/O | 170 | BDM6-B1P | I |
| 171 | GND | - | 172 | GND | - |
| 173 | BDQ53-B1P | I/O | 174 | BDQ54-B1P | I/O |
| 175 | BDQ48-B1P | I/O | 176 | BDQ51-B1P | I/O |
| 177 | GND | - | 178 | GND | - |
| 179 | BDQ56-B1P | I/O | 180 | BDQ62-B1P | I/O |
| 181 | BDQ57-B1P | I/O | 182 | BDQ63-B1P | I/O |
| 183 | GND | - | 184 | GND | - |
| 185 | BDM7-B1P | I | 186 | BDQS7-B1N | I/O |
| 187 | GND | - | 188 | BDQS7-B1P | I/O |
| 189 | BDQ60-B1P | I/O | 190 | GND | - |
| 191 | BDQ61-B1P | I/O | 192 | BDQ59-B1P | I/O |
| 193 | GND | - | 194 | BDQ58-B1P | I/O |
| 195 | SMBDT1-E3P | I/O | 196 | GND | - |
| 197 | SMBCK1-E3P | I/O | 198 | GND | - |
| 199 | M-E3V | I | 200 | M-E3V | I |
| 1T | GND | - | 2T | GND | - |

C.3 CN1820 Select bay interface connector (72-pin)*Table C-3 Select bay interface connector (72-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | GND | - | 2 | GND | - |
| 3 | GND | - | 4 | GND | - |
| 5 | SIG40032 | I | 6 | GND | - |
| 7 | PDD07-P3P | I/O | 8 | PDD06-P3P | I/O |
| 9 | PDD09-P3P | I/O | 10 | PDD05-P3P | I/O |
| 11 | PDD10-P3P | I/O | 12 | GND | - |
| 13 | GND | - | 14 | PDD04-P3P | I/O |
| 15 | PDD08-P3P | I/O | 16 | PDD03-P3P | I/O |
| 17 | PDD11-P3P | I/O | 18 | PDD02-P3P | I/O |
| 19 | PDD12-P3P | I/O | 20 | GND | - |
| 21 | GND | - | 22 | GND | - |
| 23 | PDD13-P3P | I/O | 24 | PDD01-P3P | I/O |
| 25 | PDD14-P3P | I/O | 26 | PDD00-P3P | I/O |
| 27 | PDD15-P3P | I/O | 28 | GND | - |
| 29 | GND | - | 30 | PDIOW-P3N | O |
| 31 | PDDREQ-P3P | I | 32 | PIORDY-P3P | I |
| 33 | PDIOR-P3N | O | 34 | GND | - |
| 35 | GND | - | 36 | IDEIRQ-P3P | |
| 37 | PDDACK-P3N | O | 38 | PDA1-P3P | |
| 39 | PDA2-P3P | | 40 | PDA0-P3P | |
| 41 | PDCS3-P3N | O | 42 | PDCS1-P3N | O |
| 43 | GND | - | 44 | GND | - |
| 45 | NC | - | 46 | NC | - |
| 47 | GND | - | 48 | GND | - |
| 49 | ZSATT2-P1P | | 50 | GND | - |
| 51 | ZSATT2-P1N | | 52 | GND | - |
| 53 | GND | - | 54 | GND | - |
| 55 | ZSATR2-P1N | | 56 | GND | - |
| 57 | ZSATR2-P1P | | 58 | GND | - |
| 59 | GND | - | 60 | MBSTS2-S3N | I |
| 61 | MBSTS1-S3N | I | 62 | MBSTS0-S3N | I |
| 63 | NC | - | 64 | NC | - |
| 65 | SB-P3V | I | 66 | SB-P3V | I |
| 67 | SB-P3V | I | 68 | SB-P3V | I |
| 69 | SB-P3V | I | 70 | SB-P3V | I |
| 71 | GND | - | 72 | SB-P5V | I |
| 1T | GND | - | 2T | GND | - |

C.4 CN1900 SATA interface connector (11-pin)

Table C-4 SATA interface connector (11-pin)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | ZSATT0-P1P | I | 2 | ZSATT0-P1N | I |
| 3 | GND | - | 4 | ZSATR0-P1N | I |
| 5 | ZSATR0-P1P | I | 6 | GND | - |
| 7 | P3V | I | 8 | GND | - |
| 9 | P5V | I | 10 | GND | - |
| 11 | GND | - | | | |
| 1T | GND | - | 2T | GND | - |
| 3T | GND | - | 4T | GND | - |

C.5 CN2110 PC card interface connector (70-pin)*Table C-5 PC card interface connector (70-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | GND | - | 2 | ACAD00-PYP | I/O |
| 3 | ACAD01-PYP | I/O | 4 | ACAD03-PYP | I/O |
| 5 | ACAD05-PYP | I/O | 6 | ACAD07-PYP | I/O |
| 7 | ACCBE0-PYN | I/O | 8 | ACAD09-PYP | I/O |
| 9 | ACAD11-PYP | I/O | 10 | ACAD12-PYP | I/O |
| 11 | ACAD14-PYP | I/O | 12 | ACCBE1-PYN | I/O |
| 13 | ACPAR-PYP | I/O | 14 | ACPERR-PYN | I/O |
| 15 | ACGNT-PYN | I/O | 16 | ACINT-PYN | O |
| 17 | MCVCCA-PYV | I | 18 | MCVPPA-PYV | I |
| 19 | ACCLK-PYP | I | 20 | ACIRDY-PYN | I/O |
| 21 | ACCBE2-PYN | I/O | 22 | ACAD18-PYP | I/O |
| 23 | ACAD20-PYP | I/O | 24 | ACAD21-PYP | I/O |
| 25 | ACAD22-PYP | I/O | 26 | ACAD23-PYP | I/O |
| 27 | ACAD24-PYP | I/O | 28 | ACAD25-PYP | I/O |
| 29 | ACAD26-PYP | I/O | 30 | ACAD27-PYP | I/O |
| 31 | ACAD29-PYP | I/O | 32 | ACD02-PYP | I/O |
| 33 | ACCLKR-PYN | I/O | 34 | GND | - |
| 35 | GND | - | 36 | ACCD1-P3N | O |
| 37 | ACAD02-PYP | I/O | 38 | ACAD04-PYP | I/O |
| 39 | ACAD06-PYP | I/O | 40 | ACD14-PYP | I/O |
| 41 | ACAD08-PYP | I/O | 42 | ACAD10-PYP | I/O |
| 43 | ACVS1-P3P | I/O | 44 | ACAD13-PYP | I/O |
| 45 | ACAD15-PYP | I/O | 46 | ACAD16-PYP | I/O |
| 47 | ACA18-PYP | I | 48 | ACLOCK-PYN | I/O |
| 49 | ACSTOP-PYN | I/O | 50 | ACDEVS-PYN | I/O |
| 51 | MCVCCA-PYV | I | 52 | MCVPPA-PYV | I |
| 53 | ACTRDY-PYN | I/O | 54 | ACFRAM-PYN | I/O |
| 55 | ACAD17-PYP | I/O | 56 | ACAD19-PYP | I/O |
| 57 | ACVS2-P3P | I/O | 58 | ACRST-PYN | O |
| 59 | ACSERR-PYN | O | 60 | ACREQ-PYN | O |
| 61 | ACCBE3-PYN | I/O | 62 | ACAUDI-PYP | O |
| 63 | ACSTSC-PYP | O | 64 | ACAD28-PYP | I/O |
| 65 | ACAD30-PYP | I/O | 66 | ACAD31-PYP | I/O |
| 67 | ACCD2-P3N | O | 68 | GND | - |
| 69 | GND | - | 70 | GND | - |

C.6 IS2150 SD card interface connector (12-pin)*Table C-6 SD card interface connector (12-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | MSDAT3-E3P | I/O | 2 | MSBS-P3P | I/O |
| 3 | GND | - | 4 | FM-P3V | - |
| 5 | MSCLK-P3P | I/O | 6 | GND | - |
| 7 | MSAT0-P3P | I/O | 8 | MSAT1-P3P | I/O |
| 9 | MSAT2-P3P | I/O | 10 | SDCD-P3N | I |
| 11 | GND | - | 12 | SDWP-P3P | I |

C.7 CN2300 Docking interface connector (133-pin)*Table C-7 Docking interface connector (133-pin) (1/3)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | DCOUT | I | 2 | DCOUT | I |
| 3 | DOCDT1-S3N | O | 4 | GND | - |
| 5 | NC | - | 6 | NC | - |
| 7 | NC | - | 8 | NC | - |
| 9 | GND | - | 10 | ZUSBDC-E3P | I/O |
| 11 | ZUSBDC-E3N | I/O | 12 | GND | - |
| 13 | GND | - | 14 | NC | - |
| 15 | NC | - | 16 | GND | - |
| 17 | NC | - | 18 | NC | - |
| 19 | GND | - | 20 | GND | - |
| 21 | GND | - | 22 | ZDVTX2-P3P | I |
| 23 | ZDVTX2-P3N | I | 24 | GND | - |
| 25 | ZDVTX1-P3P | I | 26 | ZDVTX1-P3N | I |
| 27 | GND | - | 28 | DVIDET-P3N | O |
| 29 | - | - | 30 | - | - |
| 31 | - | - | 32 | - | - |
| 33 | - | - | 34 | - | - |
| 35 | - | - | 36 | DCOUT | I |
| 37 | DCOUT | I | 38 | NC | - |
| 39 | NC | - | 40 | NC | - |
| 41 | NC | - | 42 | GND | - |
| 43 | NC | - | 44 | GND | - |
| 45 | DPCONF-S5P | O | 46 | GND | - |
| 47 | GND | - | 48 | XDVCLK-P3N | I |
| 49 | XDVCLK-P3P | I | 50 | GND | - |
| 51 | NC | - | 52 | NC | - |
| 53 | GND | - | 54 | ZDVTX0-P3P | I |
| 55 | ZDVTX0-P3N | I | 56 | GND | - |
| 57 | GND | - | 58 | GND | - |
| 59 | GND | - | 60 | DVISCL-PYP | I/O |
| 61 | DVISDA-PYP | I/O | 62 | LAN-E3V | I |
| 63 | LINK-E3N | O | 64 | - | - |
| 65 | - | - | 66 | - | - |
| 67 | ZBIDDP-EXP | | 68 | ZBIDDN-EXN | |

Table C-7 Docking interface connector (133-pin) (2/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 69 | ZBIDCN-EXN | | 70 | ZBIDCP-EXP | |
| 71 | DCOUT | I | 72 | DCOUT | I |
| 73 | PWRSW-S3N | O | 74 | DDCON-P5P | I |
| 75 | NC | - | 76 | NC | - |
| 77 | GND | - | 78 | GND | - |
| 79 | GND | - | 80 | NC | - |
| 81 | GND | - | 82 | GND | - |
| 83 | GND | - | 84 | GND | - |
| 85 | NC | - | 86 | GND | - |
| 87 | NC | - | 88 | GND | - |
| 89 | GND | - | 90 | DBLUE-PXP | I |
| 91 | GND | - | 92 | DRED-PXP | I |
| 93 | GND | - | 94 | GND | |
| 95 | SCRTSD-P3P | I/O | 96 | SCRTSC-P3P | I/O |
| 97 | GND | - | 98 | ACT-E3N | O |
| 99 | - | - | 100 | - | - |
| 101 | - | - | 102 | ZBIDBN-EXN | I |
| 103 | ZBIDBP-EXP | I | 104 | ZBIDAN-EXN | O |
| 105 | ZBIDAP-EXP | O | 106 | DCOUT | I |
| 107 | DCOUT | I | 108 | EJCTRQ-S3N | O |
| 109 | M5V | I | 110 | NC | - |
| 111 | NC | - | 112 | GND | - |
| 113 | DHSYNC-P3P | I/O | 114 | DVSYNC-P3P | I/O |
| 115 | GND | - | 116 | GND | - |
| 117 | NC | - | 118 | NC | - |
| 119 | GND | - | 120 | GND | - |
| 121 | GND | - | 122 | NC | - |
| 123 | NC | - | 124 | GND | - |
| 125 | GND | - | 126 | DGREEN-PXP | I |
| 127 | GND | - | 128 | GND | - |
| 129 | GND | - | 130 | PSCL-S5P | I/O |
| 131 | PSDA-S5P | I/O | 132 | GND | - |
| 133 | DOCDT2-S3N | O | | | |

Table C-7 Docking interface connector (133-pin) (3/3)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| A1 | GND | - | A2 | GND | - |
| A3 | GND | - | A4 | GND | - |
| 1T | GND | - | 2T | GND | - |
| 3T | GND | - | 4T | GND | - |
| 5T | GND | - | 6T | GND | - |
| 7T | GND | - | 8T | GND | - |
| 9T | GND | - | 10T | GND | - |
| 11T | GND | - | 12T | GND | - |
| 13T | GND | - | 14T | GND | - |
| 15T | GND | - | 16T | GND | - |
| 17T | GND | - | 18T | GND | - |

C.8 CN2600 Mini PCI Express interface connector (52-pin)*Table C-8 Mini PCI Express interface connector (52-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | PEWAKE-E3N | O | 2 | P3V | I |
| 3 | WCHDAT-P3P | O | 4 | GND | - |
| 5 | WCHCLK-P3P | O | 6 | 1R5-P1V | I |
| 7 | MPEXRQ-P3N | I | 8 | NC | - |
| 9 | GND | - | 10 | NC | - |
| 11 | XPEMPE-P0N | O | 12 | NC | - |
| 13 | XPEMPE-P0P | O | 14 | NC | - |
| 15 | GND | - | 16 | NC | - |
| 17 | NC | - | 18 | GND | - |
| 19 | NC | - | 20 | (WLON-S3N) | O |
| 21 | GND | - | 22 | PLTRS0-E3N | - |
| 23 | ZERWL-P1N | I | 24 | E3V | I |
| 25 | ZERWL-P1P | I | 26 | GND | - |
| 27 | GND | - | 28 | 1R5-P1V | I |
| 29 | GND | - | 30 | NC | - |
| 31 | ZPETWL-P1N | O | 32 | NC | - |
| 33 | ZPETWL-P1P | O | 34 | GND | - |
| 35 | GND | - | 36 | ZUSBP8-E3N | I/O |
| 37 | GND | - | 38 | ZUSBP8-E3P | I/O |
| 39 | NC | - | 40 | GND | - |
| 41 | NC | - | 42 | NC | - |
| 43 | GND | - | 44 | NC | - |
| 45 | XCLCK1-E1P | I/O | 46 | NC | - |
| 47 | CLDAT1-E1P | I/O | 48 | 1R5-P1V | I |
| 49 | CLRST1-E3N | I/O | 50 | GND | - |
| 51 | NC | - | 52 | P3V | I |
| 1T | GND | - | 2T | GND | - |

C-9 CN3010 MDC interface connector (12-pin)*Table C-9 MDC interface connector (12-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | GND | - | 2 | NC | - |
| 3 | AZSDO1-P3P | I/O | 4 | NC | - |
| 5 | GND | - | 6 | E3V | I |
| 7 | AZSYC1-P3P | | 8 | GND | - |
| 9 | (IC3010-1) | I/O | 10 | GND | - |
| 11 | AZRST1-E3N | | 12 | XAZBC1-P3P | I |
| 1T | GND | - | 2T | GND | - |
| 3T | GND | - | 4T | GND | - |
| 5T | GND | - | 6T | GND | - |

C.10 CN3230 Keyboard interface connector (34-pin)*Table C-10 Keyboard interface connector (34-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | P5V | - | 2 | SPY-PXP | O |
| 3 | SP-GND | - | 4 | SPX-PXP | O |
| 5 | SP-P5V | - | 6 | P5V | I |
| 7 | KBSC14-S3N | O | 8 | KBSC13-S3N | O |
| 9 | KBSC12-S3N | O | 10 | KBSC15-S3N | O |
| 11 | KBSC07-S3N | O | 12 | KBSC11-S3N | O |
| 13 | KBSC01-S3N | O | 14 | KBSC10-S3N | O |
| 15 | KBSC08-S3N | O | 16 | KBSC06-S3N | O |
| 17 | KBSC04-S3N | O | 18 | KBSC05-S3N | O |
| 19 | KBSC02-S3N | O | 20 | KBSC03-S3N | O |
| 21 | KBSC09-S3N | O | 22 | KBSC00-S3N | O |
| 23 | KBRT00-S3N | I | 24 | KBRT07-S3N | I |
| 25 | KBRT04-S3N | I | 26 | KBRT01-S3N | I |
| 27 | KBRT05-S3N | I | 28 | KBRT03-S3N | I |
| 29 | KBRT02-S3N | I | 30 | KBRT06-S3N | I |
| 31 | P5V | I | 32 | CAPLED-P5N | O |
| 33 | ARWLED-P5N | O | 34 | NUMLED-P5N | O |
| 1T | GND | - | 2T | GND | - |

C.11 CN3240 Dual Point interface connector (8-pin)*Table C-11 Dual Point interface connector (8-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | SP-P5V | - | 2 | SPX-PXP | O |
| 3 | SPY-PXP | O | 4 | SP-GND | - |
| 5 | GND | - | 6 | IPDCLK-P5P | I/O |
| 7 | IPDDAT-P5P | I/O | 8 | P5V | I |

C.12 CN9500 Switch board interface connector (8-pin)*Table C-12 Switch board interface connector (8-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | PWRSW-S3N | I | 2 | GND | - |
| 3 | GPBTNA-S3N | I | 4 | GPBTNB-S3N | I |
| 5 | PULOFF-S3N | I | 6 | S3V | I |
| 7 | DBGDET-P3N | I | 8 | GND | - |
| 1T | GND | - | 2T | GND | - |

C.13 CN4100 LAN interface connector (12-pin)*Table C-13 LAN interface connector (12-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | ZBIDAP-EXP | I/O | 2 | ZBIDAN-EXN | I/O |
| 3 | ZBIDBP-EXP | I/O | 4 | ZBIDCP-EXP | I/O |
| 5 | ZBIDCN-EXN | I/O | 6 | ZBIDBN-EXN | I/O |
| 7 | ZBIDDP-EXP | I/O | 8 | ZBIDDN-EXN | I/O |
| 9 | LNP-E3V | I | 10 | LINK-E3N | O |
| 11 | LNP-E3V | I | 12 | ACT-E3N | O |
| 1T | GND | - | 2T | GND | - |

C.14 CN4230 IEEE 1394 interface connector (4-pin)*Table C-14 IEEE 1394 interface connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | ZTPB0-P3N | I/O | 2 | ZTPB0-P3P | I/O |
| 3 | ZTPA0-P3N | I/O | 4 | ZTPA0-P3P | I/O |
| 1T | GND | - | 2T | GND | - |
| 3T | GND | - | 4T | GND | - |

C.15 CN4400 Bluetooth interface connector (20-pin)*Table C-15 Bluetooth interface connector (20-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | GND | - | 2 | NC | - |
| 3 | BTMDL-P3N | O | 4 | NC | - |
| 5 | NC | - | 6 | NC | - |
| 7 | NC | - | 8 | BTRST-S3N | I |
| 9 | NC | - | 10 | NC | - |
| 11 | GND | - | 12 | NC | - |
| 13 | (GND) | - | 14 | WCHCLK-P3P | O |
| 15 | NC | - | 16 | ZUSBBT-E3P | I/O |
| 17 | ZUSBBT-E3N | I/O | 18 | WCHDAT-P3P | I |
| 19 | NC | - | 20 | BT-P3V | - |
| 1T | GND | - | 2T | GND | - |

C.16 CN4610 USB port 6 connector (4-pin)*Table C-16 USB port 6 connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | USBOPS-E5V | O | 2 | ZUSBP6-E3N | I/O |
| 3 | ZUSBP6-E3P | I/O | 4 | GND | - |
| 1T | GND | - | 2T | GND | - |
| 3T | GND | - | | | - |

C.17 CN4611 USB port 4 connector (4-pin)*Table C-17 USB port 4 connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | USBOPS-E5V | O | 2 | ZUSBP4-E3N | I/O |
| 3 | ZUSBP4-E3P | I/O | 4 | GND | - |
| 1T | GND | - | 2T | GND | - |
| 3T | GND | - | | | - |

C.18 CN4612 USB port 0 connector (4-pin)*Table C-18 USB port 0 connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | USBOPS-E5V | O | 2 | ZUSBP0-E3N | I/O |
| 3 | ZUSBP0-E3P | I/O | 4 | GND | - |
| 1T | GND | - | 2T | GND | - |
| 3T | GND | - | | | - |

C.19 CN5000 LCD interface connector (40-pin)*Table C-19 LCD interface connector (40-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | FL-P5V | I | 2 | FL-P5V | I |
| 3 | FL-P5V | I | 4 | NC | - |
| 5 | GND | - | 6 | GND | - |
| 7 | GND | - | 8 | (BRT2) | - |
| 9 | (BRT1) | - | 10 | (BRT0) | - |
| 11 | GND | - | 12 | PNL-P3V | I |
| 13 | PNL-P3V | I | 14 | P3V | I |
| 15 | TSCL-P3P | I/O | 16 | TSDA-P3P | I/O |
| 17 | ZTXDA0-PYN | I | 18 | ZTXDA0-PYP | I |
| 19 | GND | - | 20 | ZTXDA1-PYN | I |
| 21 | ZTXDA1-PYP | I | 22 | GND | - |
| 23 | ZTXDA2-PYN | I | 24 | ZTXDA2-PYP | I |
| 25 | GND | - | 26 | XTXCKA-PYN | I |
| 27 | XTXCKA-PYP | I | 28 | GND | - |
| 29 | ZTXDB0-PYN | I | 30 | ZTXDB0-PYP | I |
| 31 | GND | - | 32 | ZTXDB1-PYN | I |
| 33 | ZTXDB1-PYP | I | 34 | GND | - |
| 35 | ZTXDB2-PYN | I | 36 | ZTXDB2-PYP | I |
| 37 | GND | - | 38 | XTXCKB-PYN | I |
| 39 | XTXCKB-PYP | I | 40 | GND | - |
| 1T | GND | - | 2T | GND | - |
| 3T | GND | - | 4T | GND | - |
| 5T | GND | - | 6T | GND | - |

C.20 CN5080 RGB connector (15-pin)*Table C-20 RGB connector (15-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | MRED-PXP | O | 2 | MGREEN-PXP | O |
| 3 | MBLUE-PXP | O | 4 | NC | - |
| 5 | GND | - | 6 | GND | - |
| 7 | GND | - | 8 | GND | - |
| 9 | DDC-P5V | - | 10 | GND | - |
| 11 | NC | - | 12 | CRTSDA-P5P | I/O |
| 13 | MHSYNC-P3P | O | 14 | MVSYNC-P3P | O |
| 15 | CRTSCL-P5P | I/O | | | |
| 1T | GND | - | 2T | GND | - |

C.21 CN8800 DC-IN connector (4-pin)*Table C-21 DC-IN connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | ADPDC | - | 2 | ADPDC | - |
| 3 | GND | - | 4 | GND | - |

C.22 CN8810 Main Battery connector (10-pin)*Table C-22 Main Battery connector (10-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | (QBB11-1) | - | 2 | BTMP1 | I |
| 3 | (QBB11-4) | - | 4 | M5V | I |
| 5 | PSCL-S5P | I/O | 6 | PSDA-S5P | I/O |
| 7 | GND | - | 8 | DBT10V-S5N | I |
| 9 | GND | - | 10 | GND | - |

C.23 CN9300 RTC Battery connector (3-pin)*Table C-23 RTC Battery connector (3-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | (R3V) | - | 2 | NC | - |
| 3 | GND | - | | | |
| 1T | GND | - | 2T | GND | - |

C.24 CN8771 FAN interface connector (4-pin)*Table C-24 FAN interface connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | P5V | - | 2 | FANGO-P3P | I |
| 3 | GND | - | 4 | FPWMO-S3P | O |

C.25 CN6050 Internal microphone connector (2-pin)*Table C-25 Internal microphone connector (2-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|--------------|-----|---------|-------------|-----|
| 1 | (IMICIN-PXP) | O | 2 | A-GND | - |

C.26 J6051 External microphone connector (6-pin)*Table C-26 External Microphone connector (6-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|--------------|-----|
| 1 | A-GND | - | 2 | (EMICIN-PXP) | O |
| 3 | (EMICB-P2V) | - | 4 | DETCTA-P4N | O |
| 5 | A-GND | - | 6 | EMICB-P2V | - |

C.27 CN6170 Speaker connector (4-pin)*Table C-27 Speaker (Right) connector (4-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | SPOTR-PXN | I | 2 | SPOTR-PXP | I |
| 3 | SPOTL-PXP | - | 4 | SPOTL-PXN | I |

C.28 J6310 Headphone connector (6-pin)*Table C-28 Headphone connector (6-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | A-GND | - | 2 | HEADL-PXP | O |
| 3 | HEADR-PXP | O | 4 | DETCTA-P4N | O |
| 5 | A-GND | - | 6 | NC | - |

C.29 CN3420 Serial connector (9-pin)*Table C-29 Serial connector (9-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | DCD-PYP | O | 2 | RXD-PYN | O |
| 3 | TXD-PYN | I | 4 | DTR-PYP | I |
| 5 | GND | - | 6 | DSR-PYP | O |
| 7 | RTS-PYP | I | 8 | CTS-PYP | O |
| 9 | RING-PYP | O | | | |
| 1T | GND | - | 2T | GND | - |

C.30 CN9550 Fingerprint sensor board interface connector (6-pin)*Table C-30 System board interface connector (6-pin)*

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | E3V | I | 2 | FGSPON-S3N | I |
| 3 | GND | - | 4 | ZUSBFS-E3N | I/O |
| 5 | ZUSBFS-E3P | I/O | 6 | GND | - |
| 1T | GND | - | 2T | GND | - |

Switch Board

C.31 CN9510 System board interface connector (8-pin)

Table C-31 System board interface connector (8-pin)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | GND | - | 2 | DBGDET-P3N | I |
| 3 | S3V | I | 4 | PNLOFF-S3N | I |
| 5 | GPBTNB-S3N | I | 6 | GPBTNA-S3N | I |
| 7 | GND | - | 8 | PWRSW-S3N | I |
| 1T | GND | - | 2T | GND | - |

Fingerprint sensor Board

C.32 CN9650 System board interface connector (6-pin)

Table C-32 System board interface connector (6-pin)

| Pin No. | Signal Name | I/O | Pin No. | Signal Name | I/O |
|---------|-------------|-----|---------|-------------|-----|
| 1 | E3V | I | 2 | FGSPON-S3N | O |
| 3 | GND | - | 4 | ZUSBFS-E3N | I/O |
| 5 | ZUSBFS-E3P | I/O | 6 | GND | - |
| 1T | GND | - | 2T | GND | - |

Appendix D

Appendix D Keyboard Scan/Character Codes

Table D-1 Scan codes (set 1 and set 2) (1/4)

| Cap No. | Keytop | Code set 1 | | Code set 2 | | | Note |
|---------|--------|------------|-------|------------|-------|----|------|
| | | Make | Break | Make | Break | | |
| 01 | ' ~ | 29 | A9 | 0E | F0 | 0E | |
| 02 | 1 ! | 02 | 82 | 16 | F0 | 16 | |
| 03 | 2 @ | 03 | 83 | 1E | F0 | 1E | |
| 04 | 3 # | 04 | 84 | 26 | F0 | 26 | |
| 05 | 4 \$ | 05 | 85 | 25 | F0 | 25 | |
| 06 | 5 % | 06 | 86 | 2E | F0 | 2E | |
| 07 | 6 ^ | 07 | 87 | 36 | F0 | 36 | |
| 08 | 7 & | 08 | 88 | 3D | F0 | 3D | *1 |
| 09 | 8 * | 09 | 89 | 3E | F0 | 3E | *1 |
| 10 | 9 (| 0A | 8A | 46 | F0 | 46 | *1 |
| 11 | 0) | 0B | 8B | 45 | F0 | 45 | *1 |
| 12 | - _ | 0C | 8C | 4E | F0 | 4E | |
| 13 | = + | 0D | 8D | 55 | F0 | 55 | |
| 15 | BkSp | 0E | 8E | 66 | F0 | 66 | |
| 16 | Tab | 0F | 8F | 0D | F0 | 0D | |
| 17 | Q | 10 | 90 | 15 | F0 | 15 | |
| 18 | W | 11 | 91 | 1D | F0 | 1D | |
| 19 | E | 12 | 92 | 24 | F0 | 24 | |
| 20 | R | 13 | 93 | 2D | F0 | 2D | |
| 21 | T | 14 | 94 | 2C | F0 | 2C | |
| 22 | Y | 15 | 95 | 35 | F0 | 35 | |
| 23 | U | 16 | 96 | 3C | F0 | 3C | *1 |
| 24 | I | 17 | 97 | 43 | F0 | 43 | *1 |
| 25 | O | 13 | 98 | 44 | F0 | 44 | *1 |
| 26 | P | 19 | 99 | 4D | F0 | 4D | *1 |
| 27 | [{ | 1A | 9A | 54 | F0 | 54 | |
| 28 |] } | 1B | 9B | 5B | F0 | 5B | |

Table D-1 Scan codes (set 1 and set 2) (2/4)

| Cap No. | Keytop | Code set 1 | | Code set 2 | | | Note |
|---------|------------|------------|-------|------------|-------|----|------|
| | | Make | Break | Make | Break | | |
| 29 | \ | 2B | AB | 5D | F0 | 5D | *2 |
| 30 | Caps Lock | 3A | BA | 58 | F0 | 58 | |
| 31 | A | 1E | 9E | 1C | F0 | 1C | |
| 32 | S | 1F | 9F | 1B | F0 | 1B | |
| 33 | D | 20 | A0 | 23 | F0 | 23 | |
| 34 | F | 21 | A1 | 2B | F0 | 2B | |
| 35 | G | 22 | A2 | 34 | F0 | 34 | |
| 36 | H | 23 | A3 | 33 | F0 | 33 | |
| 37 | J | 24 | A4 | 3B | F0 | 3B | *1 |
| 38 | K | 25 | A5 | 42 | F0 | 42 | *1 |
| 39 | L | 26 | A6 | 4B | F0 | 4B | *1 |
| 40 | ; : | 27 | A7 | 4C | F0 | 4C | *1 |
| 41 | ' " | 28 | A8 | 52 | F0 | 52 | |
| 43 | Enter | 1C | 9C | 5A | F0 | 5A | *3 |
| 44 | Shift (L) | 2A | AA | 12 | F0 | 12 | |
| 45 | No.102 key | 56 | D6 | 61 | F0 | 61 | |
| 46 | Z | 2C | AC | 1A | F0 | 1A | |
| 47 | X | 2D | AD | 22 | F0 | 22 | |
| 48 | C | 2E | AE | 21 | F0 | 21 | |
| 49 | V | 2F | AF | 2A | F0 | 2A | |
| 50 | B | 30 | B0 | 32 | F0 | 32 | |
| 51 | N | 31 | B1 | 31 | F0 | 31 | |
| 52 | M | 32 | B2 | 3A | F0 | 3A | *1 |
| 53 | , < | 33 | B3 | 41 | F0 | 41 | *1 |
| 54 | . > | 34 | B4 | 49 | F0 | 49 | *1 |
| 55 | / ? | 35 | B5 | 4A | F0 | 4A | *1 |
| 57 | Shift (R) | 36 | B6 | 59 | F0 | 59 | |

Table D-1 Scan codes (set 1 and set 2) (3/4)

| Cap No. | Keytop | Code set 1 | | Code set 2 | | Note | |
|---------|---------|------------|-------|------------|-------|------|----|
| | | Make | Break | Make | Break | | |
| 58 | Ctrl | 1D | 9D | 14 | F0 | 14 | *3 |
| 60 | Alt (L) | 38 | B8 | 11 | F0 | 11 | *3 |
| 61 | Space | 39 | B9 | 29 | F0 | 29 | |
| 62 | ALT (R) | E0 38 | E0 B8 | E0 11 | E0 F0 | 11 | |
| 75 | Ins | E0 52 | E0 D2 | E0 70 | E0 F0 | 70 | *4 |
| 76 | Del | E0 53 | E0 D3 | E0 71 | E0 F0 | 71 | *4 |
| 79 | ← | E0 4B | E0 CB | E0 6B | E0 F0 | 6B | *4 |
| 80 | Home | E0 47 | E0 C7 | E0 6C | E0 F0 | 6C | *4 |
| 81 | End | E0 4F | E0 CF | E0 69 | E0 F0 | 69 | *4 |
| 83 | ↑ | E0 48 | E0 C8 | E0 75 | E0 F0 | 75 | *4 |
| 84 | ↓ | E0 50 | E0 D0 | E0 72 | E0 F0 | 72 | *4 |
| 85 | PgUp | E0 49 | E0 C9 | E0 7D | E0 F0 | 7D | *4 |
| 86 | PgDn | E0 51 | E0 D1 | E0 7A | E0 F0 | 7A | *4 |
| 89 | → | E0 4D | E0 CD | E0 74 | E0 F0 | 74 | *4 |
| 110 | Esc | 01 | 81 | 76 | F0 | 76 | |
| 112 | F1 | 3B | BB | 05 | F0 | 05 | |
| 113 | F2 | 3C | BC | 06 | F0 | 06 | |
| 114 | F3 | 3D | BD | 04 | F0 | 04 | |
| 115 | F4 | 3E | BE | 0C | F0 | 0C | |
| 116 | F5 | 3F | BF | 03 | F0 | 03 | |
| 117 | F6 | 40 | C0 | 0B | F0 | 0B | |
| 118 | F7 | 41 | C1 | 83 | F0 | 83 | |
| 119 | F8 | 42 | C2 | 0A | F0 | 0A | |
| 120 | F9 | 43 | C3 | 01 | F0 | 01 | |
| 121 | F10 | 44 | C4 | 09 | F0 | 09 | *3 |

Table D-1 Scan codes (set 1 and set 2) (4/4)

| Cap No. | Keytop | Code set 1 | | | | Code set 2 | | | | Note |
|---------|---------|---------------------|----|-------|----|------------|----|-------|----|------|
| | | Make | | Break | | Make | | Break | | |
| 122 | F11 | 57 | | D7 | | 78 | | F0 | 78 | *3 |
| 123 | F12 | 58 | | D8 | | 07 | | F0 | 07 | *3 |
| 124 | PrintSc | Refer to table 2-25 | | | | | | | | |
| 126 | Pause | Refer to table 2-25 | | | | | | | | |
| 202 | Fn | | | | | | | | | *5 |
| 203 | Win | E0 | 5B | E0 | DB | E0 | 1F | E0 | F0 | 1F |
| 204 | App | E0 | 5D | E0 | DD | E0 | 2F | E0 | F0 | 2F |

Notes:

1. * Scan codes differ by overlay function.
2. * This key corresponds to key No. 42 in the 102 key mode.
3. * Combination with the **Fn** key makes different codes.
4. * Scan codes differ by mode.
5. * The Fn key does not generate a code by itself..

Table D-2 Scan codes with left Shift key

| Cap No. | Key top | Code set 1 | | Code set 2 | |
|---------|---------|-------------|-------------|----------------|----------------|
| | | Make | Break | Make | Break |
| 55 | / | E0 AA E0 35 | E0 B5 E0 2A | E0 F0 12 E0 4A | E0 F0 4A E0 12 |
| 75 | INS | E0 AA E0 52 | E0 D2 E0 2A | E0 F0 12 E0 70 | E0 F0 70 E0 12 |
| 76 | DEL | E0 AA E0 53 | E0 D3 E0 2A | E0 F0 12 E0 71 | E0 F0 71 E0 12 |
| 79 | ← | E0 AA E0 4B | E0 CB E0 2A | E0 F0 12 E0 6B | E0 F0 6B E0 12 |
| 80 | Home | E0 AA E0 47 | E0 C7 E0 2A | E0 F0 12 E0 6C | E0 F0 6C E0 12 |
| 81 | End | E0 AA E0 4F | E0 CF E0 2A | E0 F0 12 E0 69 | E0 F0 69 E0 12 |
| 83 | ↑ | E0 AA E0 48 | E0 C8 E0 2A | E0 F0 12 E0 75 | E0 F0 75 E0 12 |
| 84 | ↓ | E0 AA E0 50 | E0 D0 E0 2A | E0 F0 12 E0 72 | E0 F0 72 E0 12 |
| 85 | PgUp | E0 AA E0 49 | E0 C9 E0 2A | E0 F0 12 E0 7D | E0 F0 7D E0 12 |
| 86 | PgDn | E0 AA E0 51 | E0 D1 E0 2A | E0 F0 12 E0 7A | E0 F0 7A E0 12 |
| 89 | → | E0 AA E0 4D | E0 CD E0 2A | E0 F0 12 E0 74 | E0 F0 74 E0 12 |
| 203 | Win | E0 AA E0 5B | E0 DB E0 2A | E0 F0 12 E0 1F | E0 F0 1F E0 12 |
| 204 | App | E0 AA E0 5D | E0 DD E0 2A | E0 F0 12 E0 2F | E0 F0 2F E0 12 |

Note : The table above shows scan codes with the left **Shift** key.
In the case of Key no. 55 Overlay mode only.

In combination with the right **Shift** key, scan codes are changed as listed below:

| | With left Shift | With right Shift |
|-------|------------------------|-------------------------|
| Set 1 | E0 AA _____ | E0 B6 |
| | E0 2A _____ | E0 36 |
| Set 2 | E0 F0 12 _____ | E0 F0 59 |
| | E0 12 _____ | E0 59 |

Table D-3 Scan codes in Numlock mode

| Cap No. | Key top | Code set 1 | | | | Code set 2 | | | |
|---------|---------|-------------|-------------|-------------|-------------------|------------|--|-------|--|
| | | Make | | Break | | Make | | Break | |
| 75 | INS | E0 2A E0 52 | E0 D2 E0 AA | E0 12 E0 70 | E0 F0 70 E0 F0 12 | | | | |
| 76 | DEL | E0 2A E0 53 | E0 D3 E0 AA | E0 12 E0 71 | E0 F0 71 E0 F0 12 | | | | |
| 79 | ← | E0 2A E0 4B | E0 CB E0 AA | E0 12 E0 6B | E0 F0 6B E0 F0 12 | | | | |
| 80 | Home | E0 2A E0 47 | E0 C7 E0 AA | E0 12 E0 6C | E0 F0 6C E0 F0 12 | | | | |
| 81 | End | E0 2A E0 4F | E0 CF E0 AA | E0 12 E0 69 | E0 F0 69 E0 F0 12 | | | | |
| 83 | ↑ | E0 2A E0 48 | E0 C8 E0 AA | E0 12 E0 75 | E0 F0 75 E0 F0 12 | | | | |
| 84 | ↓ | E0 2A E0 50 | E0 D0 E0 AA | E0 12 E0 72 | E0 F0 72 E0 F0 12 | | | | |
| 85 | PgUp | E0 2A E0 49 | E0 C9 E0 AA | E0 12 E0 7D | E0 F0 7D E0 F0 12 | | | | |
| 86 | PgDn | E0 2A E0 51 | E0 D1 E0 AA | E0 12 E0 7A | E0 F0 7A E0 F0 12 | | | | |
| 89 | → | E0 2A E0 4D | E0 CD E0 AA | E0 12 E0 74 | E0 F0 74 E0 F0 12 | | | | |
| 203 | Win | E0 2A E0 5B | E0 DB E0 AA | E0 12 E0 1F | E0 F0 1F E0 F0 12 | | | | |
| 204 | App | E0 2A E0 5D | E0 DD E0 AA | E0 12 E0 2F | E0 F0 2F E0 F0 12 | | | | |

Table D-4 Scan codes with Fn key

| Cap No. | Key top | Code set 1 | | Code set 2 | |
|---------|---------|------------|-------|------------|----------|
| | | Make | Break | Make | Break |
| 43 | ENT | E0 1C | E0 9C | E0 5A | E0 F0 5A |
| 58 | CTRL | E0 1D | E0 9D | E0 14 | E0 F0 14 |
| 60 | LALT | E0 38 | E0 B8 | E0 11 | E0 F0 11 |
| 121 | ARROW | 45 | C5 | 77 | F0 77 |
| 122 | NUMERIC | 45 | C5 | 77 | F0 77 |
| 123 | Scrl | 46 | C5 | 7E | F0 7E |

Table D-5 Scan codes in overlay mode

| Cap No. | Keytop | | Code set 1 | | Code set 2 | | |
|---------|--------|-----|------------|-------|------------|-------|----|
| | | | Make | Break | Make | Break | |
| 09 | 8 | (8) | 48 | C8 | 75 | F0 | 75 |
| 10 | 9 | (9) | 49 | C9 | 7D | F0 | 7D |
| 11 | 0 | (*) | 37 | B7 | 7C | F0 | 7C |
| 23 | U | (4) | 4B | CB | 6B | F0 | 6B |
| 24 | I | (5) | 4C | CC | 73 | F0 | 73 |
| 25 | O | (6) | 4D | CD | 74 | F0 | 74 |
| 26 | P | (-) | 4A | CA | 7B | F0 | 7B |
| 37 | J | (1) | 4F | CF | 69 | F0 | 69 |
| 38 | K | (2) | 50 | D0 | 72 | F0 | 72 |
| 39 | L | (3) | 51 | D1 | 7A | F0 | 7A |
| 40 | ; | (+) | 4E | CE | 79 | F0 | 79 |
| 52 | M | (0) | 52 | D2 | 70 | F0 | 70 |
| 54 | . | (.) | 53 | D3 | 71 | F0 | 71 |
| 55 | / | (/) | E0 35 | E0 B5 | 40 4A | E0 F0 | 4A |

Table D-6 No.124 key scan code

| Key top | Shift | Code set 1 | | | | Code set 2 | | | |
|---------|---------|------------|-------|-------|-------|------------|-------|----------|----------|
| | | Make | | Break | | Make | | Break | |
| Prt Sc | Common | E0 2A | E0 37 | E0 B7 | E0 AA | E0 12 | E0 7C | E0 F0 7C | E0 F0 12 |
| | Ctrl + | E0 37 | | E0 B7 | | E0 7C | | E0 F0 7C | |
| | Shift + | E0 37 | | E0 B7 | | E0 7C | | E0 F0 7C | |
| | Alt + | | 54 | D4 | | 84 | | F0 B4 | |

Table D-7 No.126 key scan code

| Key top | Shift | Code set 1 | | | | | | Code set 2 | | | | | | | |
|---------|----------|------------|----|----|----|----|----|------------|----|----|----|----|----|----|----|
| | | Make | | | | | | Make | | | | | | | |
| Pause | Common * | E1 | 1D | 45 | E1 | 9D | C5 | E1 | 14 | 77 | E1 | F0 | 14 | F0 | 77 |
| | Ctrl* | E0 | 46 | E0 | C6 | | | E0 | 7E | E0 | F0 | 7E | | | |

*: This key generates only make codes.

Appendix E Key Layout

E.1 United Kingdom (UK) Keyboard



Figure E-1 UK keyboard

E.2 United States (US) Keyboard

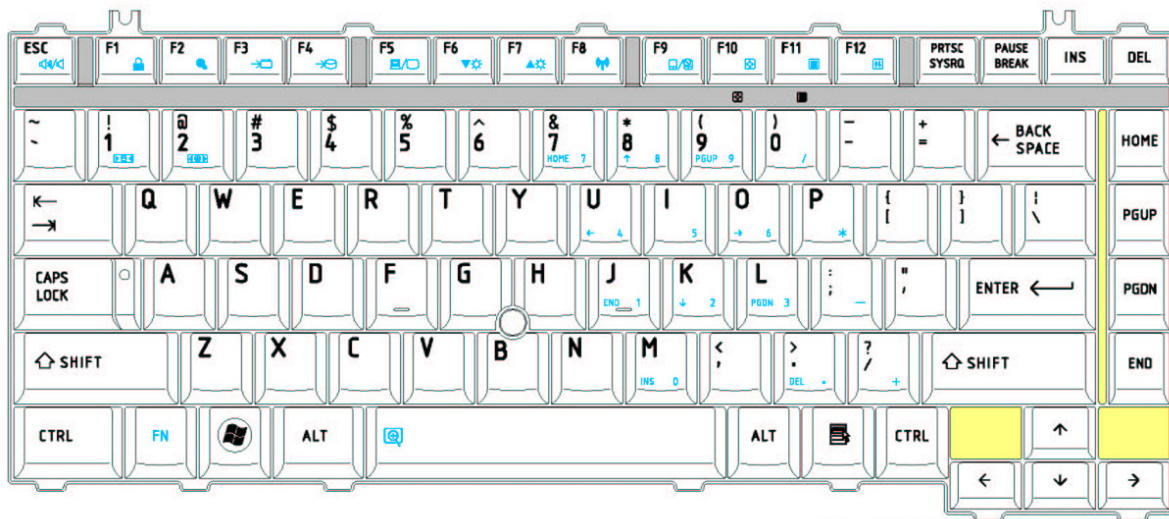


Figure E-2 US keyboard

Appendix F Wiring diagrams

F.1 RGB Monitor Loopback Connector

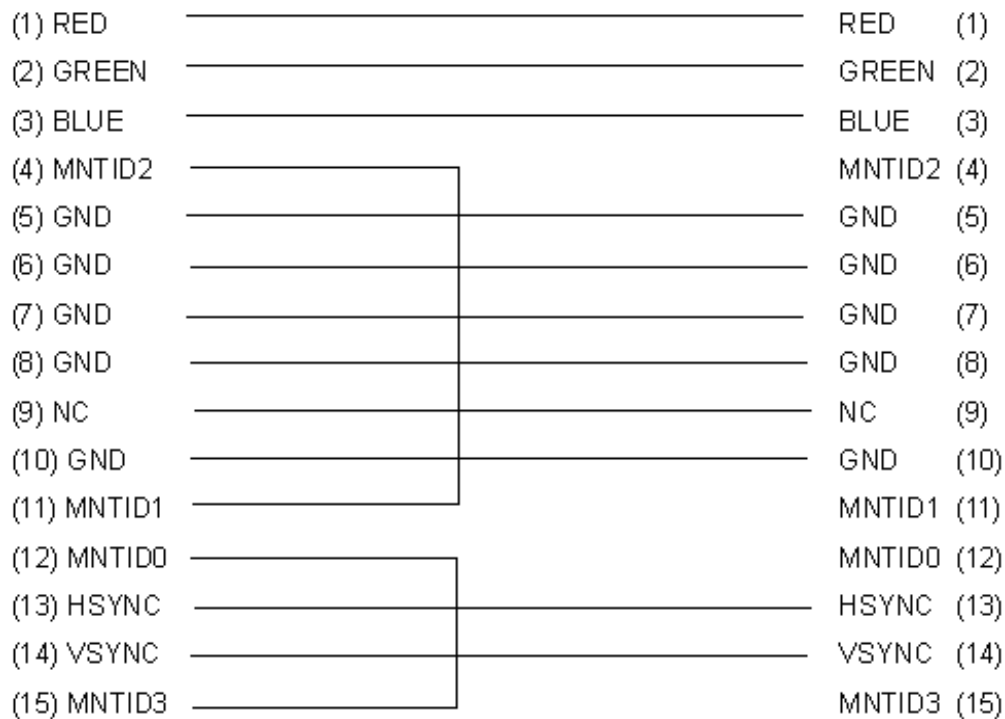


Figure F-1 RGB Monitor Loopback Connector

F.2 RS-232C Loopback Connector

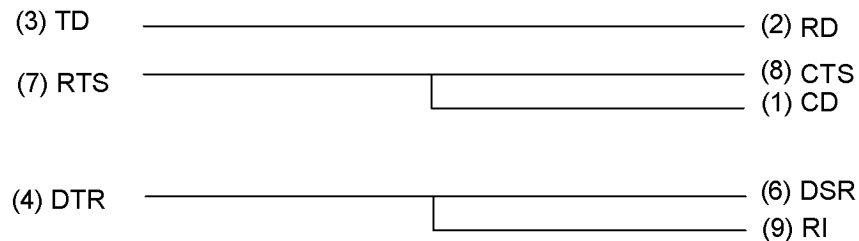


Figure F-2 RS-232C Loopback Connector

F.3 RS-232C direct connection cable (9-pin to 9-pin)

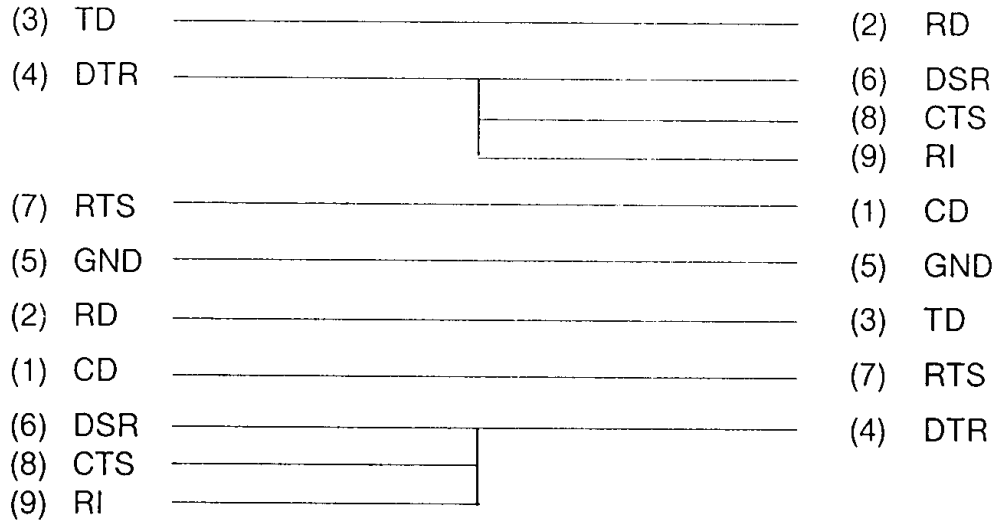


Figure F-3 RS-232C direct connection cable (9-pin to 9-pin)

F.4 RS-232C direct connection cable (9-pin to 25-pin)

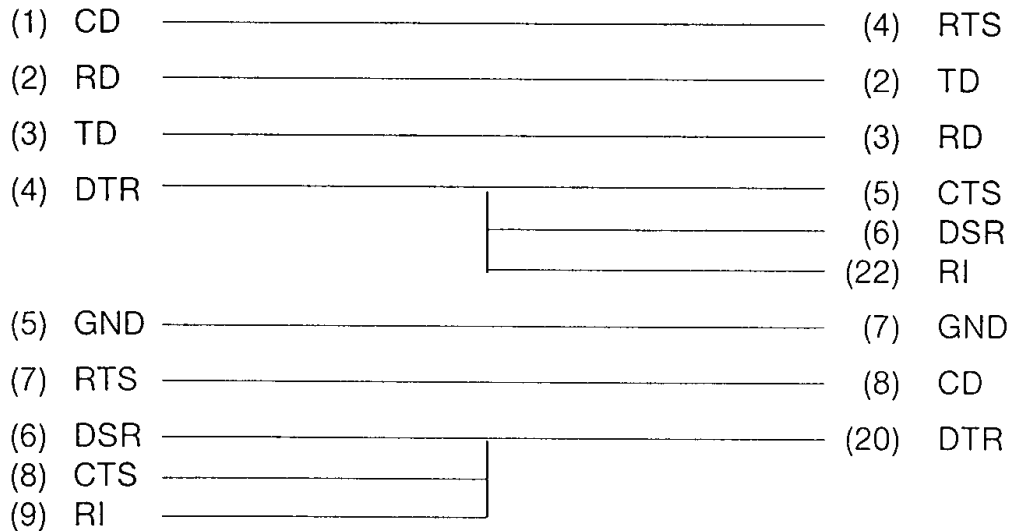


Figure F-4 RS-232C direct connection cable (9-pin to 25-pin)

F.5 LAN Loopback Connector

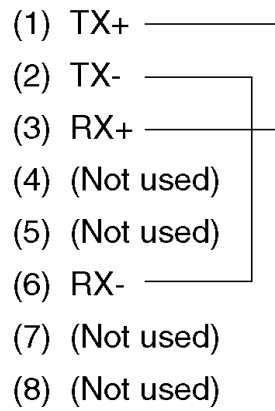


Figure F-5 LAN Loopback Connector

Appendix G BIOS rewrite procedures

This Appendix explains how to rewrite the system BIOS program when you update the system BIOS.

Tools

To rewrite the BIOS, you need the following tool:

- BIOS/EC/KBC rewriting disk for the computer that has renewed BIOS data.

Rewriting the BIOS

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC card.
4. Connect an USB FDD and insert the BIOS/EC/KBC rewriting disk into the USB FDD.
5. Turn on the power while holding down the tilde character key until a beep sounds.

For example



6. The BIOS rewriting starts
7. When the process is completed, it beeps and the system automatically reboots.

| |
|---|
| <p>NOTE:</p> <ol style="list-style-type: none">1. <i>Connect the AC adapter to the computer when you rewrite the BIOS.</i>2. <i>Do not turn off the power while you are rewriting the BIOS. If the rewrite fails, it might be impossible to start up the computer.</i>3. <i>If you fail to rewrite BIOS, then when you next turn on the power, a message may be displayed that the contents of the BIOS have been erased. In this case, insert the BIOS rewriting disk and the BIOS will be rewritten.</i> |
|---|

Appendix H EC/KBC rewrite procedures

This Appendix explains how to rewrite the EC/KBC system program when you update the EC/KBC system.

Tools

To rewrite the EC/KBC, you need the following tool:

- EC/KBC rewriting disk for the computer

Rewriting the EC/KBC

- NOTE:**
1. Rewrite the EC/KBC only when instructed by a diagnostic disk release notice.
 2. Connect the AC adaptor to the computer when you rewrite the EC/KBC.
 3. Do not turn off the power while you are rewriting the EC/KBC. If the rewrite fails, it might be impossible to start up the computer.
 4. If you fail to rewrite EC/KBC, then when you next turn on the power, a message may be displayed that the contents of the EC/KBC have been erased. In this case, insert the BIOS/EC/KBC rewriting disk and the EC/KBC will be rewritten.
 5. Normally it takes about 30 seconds to rewrite the EC/KBC. It may take 3 minutes (maximum), depending on the conditions of the computer or ICs. The computer is not hung up. Allow sufficient time. Never reboot or turn off the power to the computer before the rewriting is completed.

1. Set the system to boot mode.
2. Turn off the power to the computer.
3. Remove the external cable and PC Card.
4. Connect an USB FDD and insert the BIOS/EC/KBC rewriting disk into the USB FDD.
5. Turn on the power while holding down the **Tab** key. (Keep holding down the key until a beep sounds.) The EC/KBC rewriting starts.
6. When the EC/KBC rewrite is completed, the system is automatically turned off.

Appendix I Reliability

The following table shows MTBF (Mean Time Between Failures).

Table I-1 MTBF

| | Time (hours) |
|------|---------------------|
| MTBF | 5506H |

